

And many times with nails, and hammers strong,
 They pierce my sides, to hang their pictures on.
 My face is smutched with smoke of candle lights
 In danger to be burnt in winter nights.
 No, let me here a poor old oak still grow;
 I care not for these vain delights to know.
 For fruitless promises I do not care,
 More honor tis my own green leaves to bear.
 More honor tis to be in nature's dress,
 Than any shape that men by art express.
 I am not like to man, would praises have,
 And for opinion make my self a slave.

Man.

Why do you wish to live, and not to die,
 Since you no pleasure have but misery?
 For here you stand against the scorching sun:
 By whose fiery beams, your fresh green leaves become
 Withered; with winter's cold you quake, and shake:
 Thus in no time, or season, rest can take.

Oak.

Yet I am happier, said the oak, than man;
 With my condition I contented am.
 He nothing loves, but what he cannot get,
 And soon doth surfeit of one dish of meat:

Dislikes all company, displeased alone,
 Makes grief himself, if fortune gives him none.
 And as his mind is restless, never pleased;
 So is his body sick, and often diseased.
 His gouts, and pains, do make him sigh, and cry,
 Yet in the midst of pains would live, not die.

Man.

Alas, poor oak, thou understands, nor can
 Imagine half the misery of man.
 All other creatures only in sense join,
 But man hath something more, which is divine.
 He hath a mind, doth to the heavens aspire,
 A curiosity for to inquire:
 A wit that nimble is, which runs about
 In every corner, to seek nature out.
 For she doth hide herself, as feared to show
 Man all her works, lest he too powerful grow.
 Like to a king, his favorite makes so great,
 That at the last, he fears his power he'll get.
 And what creates desire in mans breast,
 A nature is divine, which seeks the best:
 And never can be satisfied, until
 He, like a god, doth in perfection dwell.
 If you, as man, desire like gods to be,
 I'll spare your life, and not cut down your tree.

PHILOSOPHICAL LETTERS²

Part I, Letter 4 (Discussion of Hobbes)

MADAM,

I have chosen, in the first place, the work of that famous philosopher Hobbes, called *Leviathan*, wherein I find he says, *That the cause of sense or sensitive perception is the external body or Object, which presses the Organ proper to each Sense*. To which I answer, according to the ground of my own *Philosophical Opinions*, that all things, and therefore outward objects as well as sensitive organs,

have both sense and reason, yet neither the objects nor the organs are the cause of them; for perception is but the effect of the sensitive and rational motions, and not the motions of the perception; neither does the pressure of parts upon parts make perception; for although matter by the power of self-motion is as much composable as dividable, and parts do join to parts, yet that does not make perception; nay, the several parts, between which the perception is made, may be at such a distance, as not capable to press. As for example, two men may see or hear each other at a distance, and yet there may be other

2. Excerpted from *Philosophical Letters* (London, 1664). [EEBO]

bodies between them, that do not move to those perceptions, so that no pressure can be made, for all pressures are by some constraint and force; hence, according to my opinion, the sensitive and rational free motions do pattern out each other's object, as figure and voice in each other's eye and ear; for life and knowledge, which I name rational and sensitive matter, are in every creature, and in all parts of every creature, and make all perceptions in nature, because they are the self-moving parts of nature, and according as those corporeal, rational, and sensitive motions move, such or such perceptions are made. But these self-moving parts being of different degrees (for the rational matter is purer than the sensitive) it causes a double perception in all creatures, whereof one is made by the rational corporeal motions, and the other by the sensitive; and though both perceptions are in all the body, and in every part of the body of a creature, yet the sensitive corporeal motions having their proper organs, as workhouses, in which they work some sorts of perceptions, those perceptions are most commonly made in those organs, and are double again; for the sensitive motions work either on the inside or on the outside of those organs, on the inside in dreams, on the outside awake; and although both the rational and the sensitive matter are inseparably joined and mixed together, yet do they not always work together, for oftentimes the rational works without any sensitive patterns, and the sensitive again without any rational patterns. But mistake me not, Madam, for I do not absolutely confine the sensitive perception to the organs, nor the rational to the brain, but as they are both in the whole body, so they may work in the whole body according to their own motions. Neither do I say, that there is no other perception in the eye but sight, in the ear but hearing, and so forth, but the sensitive organs have other perceptions besides these; and if the sensitive and rational motions be irregular in those parts, between which the perception is made, as for example, in the two fore-mentioned men, that see

and hear each other, then they both neither see nor hear each other perfectly; and if one's motions be perfect, but the other's irregular and erroneous, then one sees and hears better than the other; or if the sensitive and rational motions move more regularly and make perfecter patterns in the eye than in the ear, then they see better than they hear; and if more regularly and perfectly in the ear than in the eye, they hear better than they see. And so it may be said of each man singly, for one man may see the other better and more perfectly, than the other may see him; and this man may hear the other better and more perfectly, than the other may hear him; whereas, if perception were made by pressure, there would not be any such mistakes; besides the hard pressure of objects, in my opinion, would rather annoy and obscure, than inform. But as soon as the object is removed, the perception of it, made by the sensitive motions in the organs, ceases, by reason the sensitive motions cease from patterning, but yet the rational motions do not always cease so suddenly, because the sensitive corporeal motions work with the inanimate matter, and therefore cannot retain particular figures long, whereas the rational matter does only move in its own substance and parts of matter, and upon none other, as my book of *Philosophical Opinions* will inform you better. And thus perception, in my opinion, is not made by pressure, nor by species, nor by matter going either from the organ to the object, or from the object into the organ. By this it is also manifest, that understanding comes not from exterior objects, or from the exterior sensitive organs; for as exterior objects do not make perception, so they do neither make understanding, but it is the rational matter that does it, for understanding may be without exterior objects and sensitive organs. And this in short is the opinion of

MADAM,

Your faithful friend and servant.³

3. Each letter ends with this same signature.

Part I, Letter 7 (Hobbes)

MADAM,

Your author's opinion, concerning dreams (Leviathan 1.6) seems to me in some part very rational and probable, in some part not. For when he says, that *Dreams are only imaginations of them that sleep, which imaginations have been before either totally or by parcels in the sense; and that the organs of sense, as the brain and the nerves, being benumbed in sleep, as not easily to be moved by external objects, those imaginations proceed only from the agitation of the inward parts of mans body, which for the connection they have with the brain, and other organs, when they be distempered, do keep the same in motion, whereby the imaginations there formerly made, appear as if a man were waking.* This seems to my reason not very probable. For, first, dreams are not absolutely imaginations, except we do call all motions and actions of the sensitive and rational matter, imaginations. Neither is it necessary, that all imaginations must have been before either totally or by parcels in the sense; neither is there any benumbing of the organs of sense in sleep. But dreams, according to my opinion, are made by the sensitive and rational corporeal motions, by figuring several objects, as awake; only the difference is, that the sensitive motions in dreams work by rote and on the inside of the sensitive organs, whereas awake they work according to the patterns of outward objects, and exteriorly or on the outside of the sensitive organs, so that sleep or dreams are nothing else but an alteration of motions, from moving exteriorly to move interiorly, and from working after a pattern to work by rote: I do not say that the body is without all exterior motions, when asleep, as breathing and beating of the pulse (although these motions are rather interior than exterior), but that only the sensitive organs are outwardly shut, so as not to receive the patterns of outward objects, nevertheless the sensitive motions do not cease from moving inwardly, or on the inside of the sensitive organs. But the rational matter does often, as awake, so asleep or in dreams, make such figures, as the sensitive did

never make either from outward objects, or of its own accord; for the sensitive sometimes has liberty to work without objects, but the rational much more, which is not bound either to the patterns of exterior objects, or of the sensitive voluntary figures. Hence it is not divers distempers, as your author says, that cause different dreams, or cold, or heat; neither are dreams the reverse of our waking imaginations, nor all the figures in dreams are not made with their heels up, and their heads downwards, though some are; but this error or irregularity proceeds from want of exterior objects or patterns, and by reason the sensitive motions work by rote; neither are the motions reversed, because they work inwardly asleep, and outwardly awake, for madmen awake see several figures without objects. In short, sleeping and waking are somewhat after that manner, when men are called either out of their doors, or stay within their houses; or like a ship, where the mariners work all under hatches, whereof you will find more in my *Philosophical Opinions*; and so taking my leave, I rest ...

Part I, Letter 35 (Discussing Descartes)

Madam,

That the mind, according to your author's opinion, is *a substance really distinct from the body, and may be actually separated from it and subsist without it.* If he mean the natural mind and soul of man, not the supernatural or divine, I am far from his opinion; for though the mind moves only in its own parts, and not upon or with the parts of inanimate matter, yet it cannot be separated from these parts of matter and subsist by itself, as being a part of one and the same matter the inanimate is of (for there is but one matter only and one kind of matter, although several degrees), only it is the self-moving part; but yet this cannot empower it to quit the same natural body, whose part it is. Neither can I apprehend that the mind's or soul's seat should be in the glandula or kernel of the brain, and there sit like a spider in a cobweb, to whom the least motion of the cobweb gives intelligence of a fly, which he is

ready to assault, and that the brain should get intelligence by the animal spirits as his servants, which run to and fro like ants to inform it; or that the mind should, according to other's opinions, be a light, and embroidered all with ideas, like a herald's coat; and that the sensitive organs should have no knowledge in themselves, but serve only like peeping holes for the mind, or barn doors to receive bundles of pressures, like sheaves of corn. For there being a thorough mixture of animate, rational and sensitive, and inanimate matter, we cannot assign a certain seat or place to the rational, another to the sensitive, and another to the inanimate, but they are diffused and intermixed throughout all the body. And this is the reason that sense and knowledge cannot be bound only to the head or brain. For although they are mixed together, nevertheless they do not lose their interior natures by this mixture, nor their purity and subtlety, nor their proper motions or actions, but each moves according to its nature and substance, without confusion. The actions of the rational part in man, which is the mind or soul, are called thoughts, or thoughtful perceptions, for though man, or any other animal, has but five exterior sensitive organs, yet there are numerous perceptions made in these sensitive organs, and in all the body; nay, every several pore, or the ear. But both sorts, as well the rational as the sensitive, are different from each other, although both do resemble one another, as being both parts of animate matter, as I have mentioned before. Thus I'll add no more, only let you know, that I constantly remain, ...

Part I, Letter 36 (Descartes)

Madam,

That all other animals, besides man, want reason, your author endeavors to prove in his *Discourse of Method*, where his chief argument is, that other animals cannot express their mind, thoughts or conceptions, either by speech or any other signs, as man can do. For, says he, *it is not for want of the organs belonging to the framing*

of words, as we may observe in parrots and pies, which are apt enough to express words they are taught, but understand nothing of them. My answer is, that one man expressing his mind by speech or words to another, does not declare by it his excellency and supremacy above all creatures, but for the most part more folly, for a talking man is not so wise as a contemplating man. But by reason other creatures cannot speak or discourse with each other as men, or make certain signs, whereby to express themselves as dumb and deaf men do, should we conclude they have neither knowledge, sense, reason, or intelligence? Certainly, this is a very weak argument; for one part of a man's body, as one hand, is not less sensible than the other, nor the heel less sensible than the heart, not the leg less sensible than the head, but each part has its sense and reason, and so consequently its sensitive and rational knowledge; and although they cannot talk or give intelligence to each other by speech, nevertheless each has its own peculiar and particular knowledge, just as each particular man has his own particular knowledge, for one man's knowledge is not another man's knowledge; and if there be such a peculiar and particular knowledge in every several part of one animal creature, as man, well may there be such in creatures of different kinds and sorts. But this particular knowledge belonging to each creature does not prove that there is no intelligence at all between them, no more than the want of human knowledge does prove the want of reason; for reason is the rational part of matter, and makes perception, observation, and intelligence different in every creature, and every sort of creatures, according to their proper natures, but perception, observation and intelligence do not make reason, reason being the cause, and they the effects. Hence though other creatures have not the speech, nor mathematical rules and demonstrations, with other arts and sciences, as men, yet may their perceptions and observations be as wise as men's, and they may have as much intelligence and commerce between each other, after their own manner and way, as men have after theirs. To which I leave them, and man to his conceited prerogative and excellence, resting, ...

Part I, Letter 37 (Descartes)

Madam,

Concerning sense and perception, your author's opinion is, that *it is made by a motion or impression from the object upon the sensitive organ, which impression, by means of the nerves, is brought to the brain, and so to the mind or soul, which only perceives in the brain*. Explaining it by the example of a man being blind, or walking in the dark, who by the help of his stick can perceive when he touches a stone, a tree, water, sand, and the like; which example he brings to make a comparison with the perception of light. For, says he, *light in a shining body, is nothing else but a quick and lively motion or action, which through the air and other transparent bodies tends towards the eye, in the same manner as the motion or resilience of the bodies, the blind man meets withal, tends through the stick towards the hand; hence it is no wonder that the sun can display its rays so far in an instant, seeing that the same action, whereby one end of the stick is moved, goes instantly also to the other end, and would do the same if the stick were as long as heaven is distant from Earth*. To which I answer first, that it is not only the mind that perceives in the kernel of the brain, but that there is double perception, rational and sensitive, and that the mind perceives by the rational, but the body and the sensitive organs by the sensitive perception; and as there is a double perception, so there is also a double knowledge, rational and sensitive, one belonging to the mind, the other to the body; for I believe that the eye, ear, nose, tongue, and all the body, have knowledge as well as the mind, only the rational matter, being subtle and pure, is not encumbered with the grosser part of matter, to work upon, or with it, but leaves that to the sensitive, and works or moves only in its own substance, which makes a difference between thoughts and exterior senses. Next I say, that it is not the motion or reaction of the bodies the blind man meets withal which makes the sensitive perception of these objects, but the sensitive corporeal motions in the hand do pattern out the figure of the stick, stone, tree, sand, and the like. And as for comparing the

perception of the hand, when by the help of the stick it perceives the objects, with the perception of light, I confess that the sensitive perceptions do all resemble each other, because all sensitive parts of matter are of one degree, as being sensible parts, only there is a difference according to the figures of the objects presented to the senses; and there is no better proof for perception being made by the sensitive motions in the body, or sensitive organs, but that all these sensitive perceptions are alike and resemble one another; for if they were not made in the body of the sentient, but by the impression of exterior objects, there would be so much difference between them, by reason of diversity of objects, as they would have no resemblance at all. But for a further proof of my own opinion, if the perception proceeded merely from the motion, impression and resistance of the objects, the hand could not perceive those objects, unless they touched the hand itself, as the stick does; for it is not probable that the motions of the stone, water, sand, etc., should leave their bodies and enter into the stick, and so into the hand; for motion must be either something or nothing; if something, the stick and hand would grow bigger, and the objects touched less, or else the touching and the touched must exchange their motions, which cannot be done so suddenly, especially between solid bodies; but if motion has no body, it is nothing, and how nothing can pass or enter or move some body, I cannot conceive. 'Tis true there is no part that can subsist singly by itself, without dependence upon each other, and so parts do always join and touch each other, which I am not against; but only I say perception is not made by the exterior motions of exterior parts of objects, but by the interior motions of the parts of the body sentient. But I have discoursed hereof before, and so I take my leave, resting, ...

Part II, Letter 6 (Discussing Henry More)

Madam,

Your author demands, *whether there was ever any man, that was not mortal, and whether there be any mortal*

that had not a beginning? Truly, if nature be eternal, all the material figures which ever were, are, and can be, must be also eternal in nature, for the figures cannot be annihilated, unless nature be destroyed and although a creature is dissolved and transformed into numerous different figures, yet all these several figures remain still in those parts of matter, whereof that creature was made, for matter never changes, but is always one and the same, and figure is nothing else but matter transposed or transformed by motion in several modes or ways. But if you conceive matter to be one thing, figure another, and motion a third, several, distinct and dividable from each other, it will produce gross errors, for, matter, motion, and figure, are but one thing. And as for the common question, whether the egg was before the chick, or the chick before the egg, it is but a threadbare argument, which proves nothing, for there is no such thing as first in eternity, neither does time make productions or generations, but matter; and whatever matter can produce or generate, was in matter before it was produced; hence the question is, whether matter, which is nature, had a beginning, or not? I say not: for put that the case, the figures of earth, air, water, and fire, light and colours, heat and cold, animals, vegetables and minerals, etc., were not produced from all eternity, yet those figures have nevertheless been in matter, which is nature, from all eternity, for these mentioned creatures are only made by the corporeal motions of matter, transforming matter into such several figures; neither can there be any perishing or dying in nature, for that which man call so, is only an alteration of figure. And as all other productions are but a change of matters sensitive motions, so all irregular and extravagant opinions are nothing but a change of matters rational and interior, and those by sensitive motions exterior. For the natural mind is no less material than the body, only the matter of the mind is much purer and subtler than all the matter of the body. And thus there is nothing in nature but what is material; but he that thinks it absurd to say, the world is composed of mere self-moving matter, may consider, that it is more absurd to believe there are immaterial substances or spirits in nature, as also a spirit of nature, which is the vicarious power of God upon matter; for

why should it not be as probable, that God did give matter a self-moving power to herself, as to have made another creature to govern her? For nature is not a babe, or child, to need such a spiritual nurse, to teach her to go, or to move; neither is she so young a lady as to have need of a governess, for surely she can govern herself; she needs not a guardian for fear she should run away with a younger brother, or one that cannot make her a jointure. But leaving those strange opinions to the fancies of their authors, I'll ask no more, but that I am, ...

Part II, Letter 31 (More)

Madam,

I will leave the controversy of free-will and necessity, which your author is discouraging of, to divines to decide, only I say this, that nature has a natural free-will and power of self-moving, and is not necessitated; but yet that this free-will proceeds from God, who has given her both will and power to act freely. But as for the question, whether there be nothing in the universe but mere body? I answer that my opinion is not that there is nothing in the world but mere body, but that nature is purely material or corporeal, and that there is no part of nature, or natural creature, which is not matter, or body, or made of matter; also, that there is not anything else mixed with body as a copartner in natural actions, which is distinct from body or matter; nevertheless, there may be supernatural spiritual beings or substances in nature, without any hindrance to matter or corporeal nature. The same I may say of the natural material, and the divine and supernatural soul; for though the divine soul is in a natural body, and both their powers and actions are different, yet they cause no ruin or disturbance to each other, but do in many cases agree with each other, without encroachment upon each other's powers or actions; for God, as he is the God of all things, so the God of order. Hence it is not probable that created immaterial or incorporeal beings should order corporeal nature, no more than corporeal nature orders immaterial or incorporeal creatures. Neither can, in my opinion, incorporeal creatures be clearly conceived by corporeals, although

they may really exist and subsist in nature; only, as I said before, it is well to be considered, that there is a difference between being in nature and being a part of nature; for bodiless things, and so spiritual substances, although they may exist in nature, yet they are not natural, nor parts of nature, but supernatural, nature being merely corporeal, and matter the ground of nature; and all that is not built upon this material ground, is nothing in nature. But you will say, the divine soul is a part of man, and man a part of nature, hence the divine soul must needs be a part of nature. I answer, no: For the divine soul is not a part of nature, but supernatural, as a supernatural gift from God only to man, and to no other creature; and although in this respect it may be called a part of man, yet it is no natural or material part of man; neither does this supernatural gift disturb nature or natural matter, or natural matter this supernatural gift. And so leaving them both, I rest, ...

Part II, Letter 32 (More)

MADAM,

If you desire my opinion concerning witches, whereof your learned author has many discourses and stories, I will tell you really, that in my sense and reason, I do not believe any, except for the witch of Endor, which the Scripture makes mention of; for though I believe that there is a Devil, as the word of God and the Church inform me, yet I am not of the opinion that God should suffer him to have such a familiar conjunction, and make such contracts with Man as to empower him to do mischief and hurt to others, or to foretell things to come, and the like; for I believe that all things immaterial, such as spirits, angels, devils, and the divine soul of man, are no parts of nature, but supernatural, nature knowing of no creature that belongs to her, but what is material; and since incorporeal creatures are no parts of nature, they neither have natural actions, nor are they concerned as copartners or co-agents in the actions of nature and natural creatures; but as their substances, so their actions are supernatural, and beyond our conceiving.

As for fairies, I will not say, but there may be such creatures in nature, and have airy bodies, and be of a human shape, and have human actions, as I have described in my Book of Poems; for there are many things in nature, whereof man has no knowledge at all, and it would be a great folly for any one to deny what he does not see, or to ascribe all the unusual effects in nature to immaterial spirits; for nature is so full of variety, that she can and does present sometimes such figures to our exterior senses as are not familiar to us, so as we need not to take our refuge to immaterial spirits: nay, even those that are so much for incorporeal spirits must confess that they cannot be seen in their own natures, as being invisible, and therefore have need to take vehicles of some grosser bodies to manifest themselves to men: and if spirits cannot appear without bodies, the nearest way is to ascribe such unusual effects or apparitions, as happen sometimes, rather to matter that is already corporeal, and not to go so far as to draw immaterial spirits to natural actions, and to make those spirits take vehicles fit for their purposes: for nature takes sometimes delight in unusual varieties.

Concerning those stories which your author relates of the strange effects of food received into a man's body, how they did work upon the imagination, and change and transform the humors of those that did feed upon them, those, I say, seem very probable to me. As for example, *of a wench who, being struck into an epilepsy upon the seeing a malefactor's head cut off, was advised to drink cats-blood; which being done, she not long after degenerated into the nature and property of that animal, cried and jumped like a cat, and hunted mice with the same silence and watchfulness as they do. Then of a man, being long fed with swine's-blood, who took a special pleasure in wallowing and tumbling himself in the mire. Also of a girl, which being nourished up with goat's-milk, would skip like a goat, and graze on trees as goats use to do. And of a man, who by eating the brains of a bear, became of a bear-like disposition.* All these stories I believe to be true; for naturally the motions of a man may sometimes sympathize so much with the received food, as to make an alteration in his humour or disposition. But although it is natural, yet it is not regular,

at least not usual, but proceeds from an irregular and unusual change of motions, like the conception and generation of a monster. For if it were ordinary, then those which drink much of the blood of beasts would also degenerate into a beastly nature, the contrary whereof is sufficiently known; likewise those that drink much

of cow's-milk would change into their humors and natures. But certainly some kinds of meats do not only cause sickness, but madness, and strange imaginations; all which unnatural or unusual accidents are caused by matter's irregular motions, whereof I have declared my opinion in other places, and so I rest, ...

OBSERVATIONS UPON EXPERIMENTAL PHILOSOPHY⁴

An Argumental Discourse Concerning some principal subjects in Natural Philosophy, necessary for the better understanding, not only of this, but all other philosophical works, hitherto written by the authoress.

When I was setting forth this book of *Experimental Observations*, a dispute chanced to arise between the rational parts of my mind concerning some chief points and principles in Natural Philosophy; for some new thoughts endeavoring to oppose and call in question the truth of my former conceptions, caused a war in my mind, which in time grew to that height, that they were hardly able to compose the differences between themselves, but were in a manner necessitated to refer them to the arbitration of the impartial reader, desiring the assistance of his judgment to reconcile their controversies, and, if possible, to reduce them to a settled peace and agreement.

The first difference did arise about the question, *how it came, that matter was of several degrees, as animate and inanimate, sensitive and rational?* for my latter thoughts would not believe that there was any such difference of degrees of matter. To which my former conceptions answered, that nature, being eternal and infinite, it could not be known how she came to be such, no more than a reason could be given how God came to be: for nature, said they, is the infinite servant of God, and her origin cannot be described by any finite or particular creature; for what is infinite, has neither beginning nor end; but that natural matter consisted of so many degrees as mentioned, was evidently perceived by her

effects or actions; by which it appeared first, that nature was a self-moving body, and that all her parts and creatures were so too. Next, that there was not only an animate or self-moving and active, but also an inanimate, that is, a dull and passive degree of matter; for if there were no animate degree, there would be no motion, and so no action nor variety of figures; and if no inanimate, there would be no degrees of natural figures and actions, but all actions would be done in a moment, and the figures would all be so pure, fine and subtle, as not to be subject to any grosser perception such as our human, or other the like perceptions are. This inanimate part of matter, said they, had no self-motion, but was carried along in all the actions of the animate degree, and so was not moving, but moved; which animate part of matter being again of two degrees, viz. sensitive and rational, the rational being so pure, fine and subtle, that it gave only directions to the sensitive, and made figures in its own degree, left the working with and upon the inanimate part, to the sensitive degree of matter, whose office was to execute both the rational parts design, and to work those various figures that are perceived in nature; and those three degrees were so inseparably commixed in the body of nature, that none could be without the other in any part or creature of nature, could it be divided to an atom; for as in the construction of a house there is first required an architect or surveyor, who orders and designs the building, and puts the laborers to work; next the laborers or workmen themselves, and lastly the materials of which the house is built: so the rational part, said they, in the framing of natural effects, is, as it were,

4. Excerpted from *Observations Upon Experimental Philosophy* (London: Printed by A. Maxwell, 1666). [EEBO]

the surveyor or architect; the sensitive, the laboring or working part, and the inanimate, the materials, and all these degrees are necessarily required in every composed action of nature.

To this, my latter thoughts excepted, that in probability of sense and reason, there was no necessity of introducing an inanimate degree of matter; for all those parts which we call gross, said they, are no more but a composition of self-moving parts, whereof some are denser and some rarer than others; and we may observe, that the denser parts are as active as the rarest; for example, Earth is as active as air or light, and the parts of the body are as active as the parts of the soul or mind, being all self-moving, as it is perceivable by their several, various compositions, divisions, productions and alterations; nay, we do see, that the Earth is more active in the several productions and alterations of her particulars, than what we name celestial lights, which observation is a firm argument to prove that all matter is animate or self-moving, only there are degrees of motion, that some parts move slower and some quicker.

Hereupon my former thoughts answered, that the difference consisted not only in the grossness, but in the dullness of the inanimate parts; and that, since the sensitive animate parts were laboring on, and with the inanimate, if these had self-motion, and that their motion was slower than that of the animate parts, they would obstruct, cross and oppose each other in all their actions, for the one would be too slow, and the other too quick.

The latter thoughts replied, that this slowness and quickness of motion would cause no obstruction at all; for, said they, a man that rides on a horse is carried away by the horse's motion, and has nevertheless also his own motions himself; neither does the horse and man transfer or exchange motion into each other, nor do they hinder or obstruct one another.

The former thoughts answered, it was true, that motion could not be transferred from one body into another without matter or substance; and that several self-moving parts might be joined, and each act a part without the least hindrance to one another; for not all the parts of one composed creature (for example man)

were bound to one and the same action; and this was an evident proof that all creatures were composed of parts, by reason of their different actions; nay, not only of parts, but of self-moving parts: also they confessed, that there were degrees of motion, as quickness and slowness, and that the slowest motion was as much motion as the quickest. But yet, said they, this does not prove that nature consists not of inanimate matter as well as of animate; for it is one thing to speak of the parts of the composed and mixed body of nature, and another thing to speak of the constitutive parts of nature, which are, as it were, her ingredients of which nature is made up as one entire self-moving body; for sense and reason do plainly perceive that some parts are more dull, and some more lively, subtle and active; the rational parts are more agile, active, pure and subtle than the sensitive; but the inanimate have no activity, subtlety and agility at all, by reason they want self-motion; nor no perception, for self-motion is the cause of all perception; and this triumvirate of the degrees of matter, said they, is so necessary to balance and poise nature's actions, that otherwise the creatures which nature produces would all be produced alike, and in an instant; for example, a child in the womb would as suddenly be framed as it is figured in the mind; and a man would be as suddenly dissolved as a thought. But sense and reason perceives that it is otherwise; to wit, that such figures as are made of the grosser parts of matter, are made by degrees, and not in an instant of time, which does manifestly evince that there is and must of necessity be such a degree of matter in nature as we call inanimate; for surely although the parts of nature are infinite and have infinite actions, yet they cannot run into extremes but are balanced by their opposites, so that all parts cannot be alike rare or dense, hard or soft, dilating or contracting, etc. But some are dense, some rare, some hard, some soft, some dilative, some contractive, etc., by which the actions of nature are kept in an equal balance from running into extremes....

At this declaration of my former thoughts, the latter appeared somewhat better satisfied, and had almost yielded to them, but that they had yet some scruples left, which hindered them from giving a full assent to

my former rational conceptions. First they asked, how it was possible, that that part of matter which had no innate self-motion, could be moved? For, said they, if it be moved, it must either be moved by its own motion, or by the motion of the animate part of matter: by its own motion it cannot move, because it has none. But if it be moved by the motion of the animate, then the animate must of necessity transfer motion into it: that so, being not able to move by an innate motion, it might move by a communicated motion.

The former thoughts answered, that they had resolved this question heretofore by the example of a horse and a man, where the man was moved and carried along by the horse, without any communication or translation of motion from the horse into the man; also a stick, said they, carried in a man's hand, goes along with the man, without receiving any motion from his hand.

My latter thoughts replied, that a man and a stick were parts or creatures of nature, which consist of a commixture of animate or self-moving matter, and that they did move by their own motions, even at the time when they were carried along by other parts; but with the inanimate part of matter it was not so; for it having no self-motion, could in no way move.

You say well, answered my former thoughts, that all the parts of nature, whenever they move, move by their own motions; which proves that no particular creature or effect of composed nature can act upon another, but that one can only occasion another to move thus or thus; as in the mentioned example, the horse does not move the man, but occasions him only to move after such or such a manner; also the hand does not move the stick, but is only an occasion that the stick moves thus, for the stick moves by its own motion. But as we told you before, this is to be understood of the parts of the composed body of nature, which as they are nature's creatures and effects, so they consist also of a commixture of the aforementioned degrees of animate and inanimate matter; but our discourse is now of those parts which do compose the body of nature, and make it what it is. And as of the former parts none can be said moved, but all are moving, as having self-motion within them,

so the inanimate part of matter considered as it is an ingredient of nature, is in no way moving, but always moved. The former parts, being effects of the body of nature, for distinction's sake may be called effective parts; but these, that is, the animate and inanimate, may be called constitutive parts of nature. Those follow the composition of nature, but these are the essential parts, which constitute the body of nature, whereof the animate, by reason of their self-motion, are always active and perceptive, but the inanimate is neither active nor perceptive, but dull and passive. And you may plainly perceive it, added my former thoughts, by the alleged example, for as the stick has no animal motion, and yet is carried along by and with the animal wherever it goes, so the inanimate matter, although it has no motion at all, yet it goes along with the animate parts wherever they'll have it. The only difference is this, we told you before, that the stick being composed of animate as well as inanimate matter cannot properly be said moved, but occasioned to such a motion by the animal that carries it, whereas the inanimate part cannot be said occasioned, but moved.

My later thoughts replied, that the alleged example of the carried stick could give them no full satisfaction as yet; for, said they, put the case the stick had its own motion, yet it has not a visible, exterior, local, progressive motion, such as animals have, and therefore it must have to receive that motion from the animal that carries it; for nothing can be occasioned to that which it has not in itself.

To which the former answered first, that although animals had a visible exterior progressive motion, yet not all progressive motion was an animal motion. Next, they said that some creatures did often occasion others to alter their motions from an ordinary to an extraordinary effect; and if it be no wonder, said they, that cheese, roots, fruits, etc., produce worms, why should it be a wonder for an animal to occasion a visible progressive motion in a vegetable or mineral, or any other sort of creature? For each natural action, said they, is local, were it no more than the stirring of a hair's breadth, nay, of an atom; and all composition and division, contraction, dilation, nay, even retention, are local motions;

for there is nothing in so just a measure but it will vary more or less; nay, if it did not to our perception, yet we cannot from thence infer that it does not at all; for our perception is too weak and gross to perceive all the subtle actions of nature; and if so, then certainly animals are not the only creatures that have local motion, but there is local motion in all parts of nature....

My later thoughts asked, since nature's parts were so closely joined in one body, how it was possible that there could be finite, and not single parts?

The former answered, that finite and single parts were not all one and the same; for single parts, said they, are such as can subsist by themselves; neither can they properly be called parts, but are rather finite wholes; for it is a mere contradiction to say single parts, they having no reference to each other, and consequently not to the body of nature. But what we call finite parts are nothing else but several corporeal figurative motions, which make all the difference that is between the figures or parts of nature, both in their kinds, sorts and particulars. And thus finite and particular parts are all one, called thus by reason they have limited and circumscribed figures by which they are discerned from each other, but not single figures, for they are all joined in one body and are parts of one infinite whole, which is nature; and these figures being all one and the same with their parts of matter, change according as their parts change, that is, by composition and division; for were nature an atom, and material, that atom would have the properties of a body, that is, be dividable and composable, and so be subject to infinite changes, although it were not infinite in bulk.

My later thoughts replied, that if a finite body could have infinite compositions and divisions, then nature need not to be infinite in bulk or quantity; besides, said they, it is against sense and reason that a finite should have infinite effects.

The former answered first, as for the infiniteness of nature, it was certain that nature consisted of infinite parts, which, if so, she must needs also be of an infinite bulk or quantity; for wherever is an infinite number of parts or figures, there must also be an infinite whole, since a whole and its parts differ not really, but only in

the manner of our conception; for when we conceive the parts of nature as composed in one body, and inseparable from it, the composition of them is called a whole; but when we conceive their different figures, actions and changes, and that they are dividable from each other, or amongst themselves, we call them parts; for by this one part is discerned from the other part, as for example a mineral from a vegetable, a vegetable from an element, and element from an animal, etc., and one part is not another part. But yet these parts are and remain still parts of infinite nature, and cannot be divided into single parts, separated from the body of nature, although they may be divided amongst themselves infinite ways by the self-moving power of nature. In short, said they, a whole is nothing but a composition of parts, and parts are nothing but a division of the whole.

Next, as for the infinite compositions and divisions of a finite whole, said they, it is not probable that finite can have infinite effects, or can be actually divided into infinite parts; but yet a body cannot but have the properties of a body as long as it lasts; and therefore if a finite body should last eternally, it would eternally retain the effects, or rather proprieties of a body, that is, to be dividable and composable; and if it have self-motion, and was actually divided and composed, then those compositions and divisions of its parts would be eternal too. But what is eternal is infinite, and therefore in this sense one cannot say amiss, but that there might be eternal compositions and divisions of the parts of a finite whole; for wherever is self-motion there is no rest. But, mistake us not, for we do not mean divisions or compositions into single or infinite parts, but a perpetual and eternal change and self-motion of the parts of that finite body or whole amongst themselves.

But because we speak now of the parts of infinite nature, which are infinite in number, though finite, or rather distinguished by their figures, it is certain, said they, that there being a perpetual and eternal self-motion in all parts of nature, and their number being infinite, they must of necessity be subject to infinite changes, compositions, and divisions, not only as for their duration, or eternal self-motion, but as for the number of their parts. For parts cannot remove but

from and to parts, and as soon as they are removed from such parts, they join to other parts, which is nothing else but a composition and division of parts, and this composition and division of the infinite parts of nature hinders that there are no actual divisions or compositions of a finite part, because the one counterbalances the other. For if by finite you understand a single part, there can be no such thing in nature, since what we call the finiteness of parts is nothing else but the difference and change of their figures caused by self-motion; and therefore when we say infinite nature consists of an infinite number of finite parts, we mean of such parts as may be distinguished or discerned from each other by their several figures, which figures are not constant, but change perpetually in the body of nature, so that there can be no constant figure allowed to no part, although some do last longer than others.

Then my later thoughts desired to know, whether there were not degrees of motion, as well as there are of matter?

The former answered, that without question there were degrees of motion, for the rational parts were more agile, quick and subtle in their corporeal actions than the sensitive, by reason they were of a purer and finer degree of matter, and free from laboring on the inanimate parts; but withal, they told them, that the several different and opposite actions of nature hinder each other from running into extremes. And as for the degrees of matter, there could not possibly be more than animate and inanimate, neither could any degree go beyond matter, so as to become immaterial. The truth is, said they, to balance the actions of nature, it cannot be otherwise but there must be a passive degree of matter, opposite to the active, which passive part is that we call inanimate. For though they are so closely intermixed in the body of nature that they cannot be separated from each other, but by the power of God, nevertheless, sense and reason may perceive that they are distinct degrees, by their distinct and different actions, and may distinguish them so far, that one part is not another part and that the actions of one degree are not the actions of the other. Hence as several self-moving parts may be joined in one composed

body, and may either act differently without hindrance and obstruction to each other, or may act jointly and agreeably to one effect, so may the sensitive parts carry or bear along with them the inanimate parts, without either transferring and communicating motion to them, or without any co-operation or self-action of the inanimate parts. And as for matter, as there can be no fewer degrees than animate and inanimate, sensitive and rational, so neither can there be more; for as we mentioned heretofore, were there nothing but animate or self-moving matter in nature, the parts of nature would be too active and quick in their several productions, alterations and dissolutions, and all things would be as soon made, as thoughts. Again, were there no inanimate degree of matter, the sensitive corporeal motions would retain the figures or patterns of exterior objects, as the rational do, which yet we perceive otherwise. For so soon as the object is removed, the sensitive perception is altered, and though the sensitive parts can work by rote, as in dreams and some distempers, yet their voluntary actions are not so exact as their exterior perceptive actions, nor altogether and always so regular as the rational, and the reason is that they are bound to bear the inanimate parts along with them in all their actions. Also were there no degree of inanimate matter, nature's actions would run into extremes, but because all her actions are balanced by opposites, they hinder both extremes in nature and produce all that harmonious variety that is found in nature's parts....

Then my later thoughts desired to know, whether motion could be annihilated?

The former said, no: because nature was infinite, and admitted of no addition nor diminution; and consequently of no new creation nor annihilation of any part of hers.

But, said the later, if motion be an accident, it may be annihilated.

The former answered, they did not know what they meant by the word *accident*.

The later said, that an accident was something in a body, but nothing without a body.

If an accident be something, answered the former, then certainly it must be body; for there is nothing but

what is corporeal in nature; and if it be body, then it cannot be nothing at no time, but it must of necessity be something.

But it cannot subsist of, and by itself, replied my later thoughts, as a substance; for although it has its own being, yet its being is to subsist in another body.

The former answered, that if an accident was nothing without a body or substance, and yet something in a body; then they desired to know, how, being nothing, it could subsist in another body, and be separated from another body; for composition and division, said they, are attributes of a body, since nothing can be composed or divided but what has parts; and nothing has parts but what is corporeal or has a body, and therefore if an accident can be in a body, and be separated from a body, it would be nonsense to call it nothing.

But then my later thoughts asked, that when a particular motion ceased, what became of it?

The former answered, it was not annihilated, but changed.

The later said, how can motion be corporeal, and yet one thing with body? Certainly if body be material, and motion too, they must needs be two several substances.

The former answered, that motion and body were not two several substances; but motion and matter made one self-moving body; and so was place, color, figure, etc., all one and the same with body.

The later replied, that a man, and his action were not one and the same, but two different things.

The former answered, that a man and his actions were no more different than a man was different from himself; for, said they, although a man may have many different actions, yet were not that man existent, the same actions would not be; for though many men have the like actions, yet they are not the same.

But then replied the later, place cannot be the same with body, nor color; because a man may change his place and his color, and yet retain his body.

Truly, said the former, if place be changed, then body must change also; for wherever is place, there is body; and though it be a vulgar phrase, that a man changes his place when he removes, yet it is not a proper

philosophical expression; for he removes only from such parts to such parts; so that it is a change or a division and composition of parts, and not of place. And as for color, though it changes, yet that proves not that it is not a body, or can be annihilated. The truth is, though figure, motion, color, etc., do change, yet they remain still in nature, and it is impossible that nature can give away, or lose the least of her corporeal attributes or properties; for nature is infinite in power, as well as in act, we mean, for acting naturally; and therefore, whatever is not in present act, is in the power of infinite nature.

But, said my later thoughts, if a body be divided into very minute parts as little as dust, where is the color then?

The color, answered the former, is divided as well as the body; and though the parts thereof be not subject to our sensitive perception, yet they have nevertheless their being; for all things cannot be perceptible by our senses.

The later said, that the color of a man's face could change from pale to red, and from red to pale, and yet the substance of the face remain the same, which proved that color and substance were not the same.

The former answered, that although the color of a man's face did change without altering the substance thereof, yet this proved no more that color was immaterial, than that motion was immaterial; for a man may put his body into several postures, and have several actions, and yet without any change of the substance of his body; for all actions do not necessarily import a change of the parts of a composed figure, there being infinite sorts of actions.

We will leave accidents, said my later thoughts, and return to the inanimate part of matter; and since you declare that all parts of nature do worship and adore God, you contradict yourself in allowing an inanimate degree of matter, by reason where there is no self-motion, there can be no perception of God, and consequently no worship and adoration.

The former answered, that the knowledge of God did not consist in exterior perception; for God, said they, being an infinite, incomprehensible, supernatural and immaterial essence, void of all parts, can in no way be

subject to perception. Nevertheless, although no part can have an exterior perception of the substance of God, as it has of particular natural creatures, yet it has conceptions of the existence of God, to wit, that there is a God above nature, on which nature depends, and from whose immutable and eternal decree it has its eternal being, as God's eternal servant; but what God is in his essence, neither nature nor any of her parts or creatures is able to conceive. And therefore although the inanimate part of matter is not perceptive, yet having an innate knowledge and life of itself, it is not improbable but it may also have an interior, fixed, and innate knowledge of the existence of God, as that he is to be adored and worshipped. And thus the inanimate part may after its own manner worship and adore God, as much as the other parts in their ways: for it is probable that God, having endued all parts of nature with self-knowledge, may have given them also an interior knowledge of himself, that is, of his existence, how he is the God of nature and ought to be worshipped by her as his eternal servant.

My later thoughts objected, that not any creature did truly know itself, much less could it be capable of knowing God.

The former answered, that this was caused through the variety of self-motion; for all creatures (said they) are composed of many several parts, and every part has its own particular self-knowledge, as well as self-motion, which causes an ignorance between them; for one part's knowledge is not another part's knowledge, nor does one part know what another knows, but all knowledge of exterior parts comes by perception. Nevertheless, each part knows itself and its own actions, and as there is an ignorance between parts, so there is also an acquaintance (especially in the parts of one composed creature), and the rational parts being most subtle, active and free, have a more general acquaintance than the sensitive; besides, the sensitive many times inform the rational, and the rational the sensitive, which causes a general agreement of all the parts of a composed figure in the execution of such actions as belong to it.

But how is it possible, replied my later thoughts, that the inanimate part of matter can be living and

self-knowing, and yet not self-moving? For life and knowledge cannot be without self-motion; and therefore if the inanimate parts have life and knowledge, they must necessarily also have self-motion.

The former answered, that life and knowledge did in no way depend upon self-motion, for had nature no motion at all, yet might she have life and knowledge; so that self-motion is not the cause of life and knowledge, but only of perception, and all the various actions of nature, and this is the reason, said they, that the inanimate part of matter is not perceptive, because it is not self-moving; for though it has life and self-knowledge as well as the animate part, yet it has not an active life, nor a perceptive knowledge. By which you may see that a fixed and interior self-knowledge may very well be without exterior perception; for though perception presupposes an innate self-knowledge as its ground and principle, yet self-knowledge does not necessarily require perception, which is only caused by self-motion; for self-motion, as it is the cause of the variety of nature's parts and actions, so it is also of their various perceptions. If it was not too great a presumption, said they, we could give an instance of God, who has no local self-motion, and yet is infinitely knowing. But we'll forbear to go so high, as to draw the infinite, incomprehensible God to the proofs of material nature.

After these and several other objections, questions and answers between the later and former thoughts and conceptions of my mind, at last some rational thoughts which were not concerned in this dispute, perceiving that they became much heated, and fearing they would at last cause a faction or civil war amongst all the rational parts, which would breed that which is called a trouble of the mind, endeavored to make a peace between them, and to that end they propounded that the sensitive parts should publicly declare their differences and controversies, and refer them to the arbitration of the judicious and impartial reader. This proposition was unanimously embraced by all the rational parts, and thus by their mutual consent this *Argumental Discourse* was set down and published after this manner. In the meantime, all the rational parts of my

mind inclined to the opinion of my former conceptions, which they thought much more probable than those of the later; and since now it is your part, ingenious readers, to give a final decision of the cause, consider well the subject of their quarrel, and be impartial in your judgment; let not self-love or envy corrupt you, but let regular sense and reason be your only rule, that you may be accounted just judges, and your equity and justice be remembered by all that honor and love it.

Chapter 3: Of Micrography, and of Magnifying and Multiplying Glasses

Although I am not able to give a solid judgment of the art of micrography and the several dioptrical instruments belonging thereto, by reason I have neither studied nor practised that art, yet of this I am confident, that this same art, with all its instruments, is not able to discover the interior natural motions of any part or creature of nature; nay, the question is, whether it can represent yet the exterior shapes and motions so exactly, as naturally they are; for art does more easily alter than inform. As for example, art makes cylinders, concave and convex-glasses, and the like, which represent the figure of an object in no part exactly and truly, but very deformed and misshapen; also a glass that is flawed, cracked, or broken, or cut into the figure of lozenges, triangles, squares, or the like, will present numerous pictures of one object. Besides, there are so many alterations made by several lights, their shadows, refractions, reflections, as also several lines, points, mediums, interposing and intermixing parts, forms and positions, as the truth of an object will hardly be known; for the perception of sight, and so of the rest of the senses, goes no further than the exterior parts of the object presented, and though the perception may be true, when the object is truly presented, yet when the presentation is false, the information must be false also. And it is to be observed that art, for the most part, makes hermaphroditical, that is, mixed figures, as partly artificial and partly natural: for art may make some metal, such as pewter, which is beneonate tin and lead, as is also brass,

and numerous other things of mixed natures. In the like manner may artificial glasses present objects, partly natural and partly artificial; nay, put the case they can present the natural figure of an object, yet that natural figure may be presented in as monstrous a shape as it may appear misshapen rather than natural. For example, a louse by the help of a magnifying-glass appears like a lobster, where the microscope enlarging and magnifying each part of it makes them bigger and rounder than naturally they are. The truth is, the more the figure by art is magnified, the more it appears misshapen from the natural, in so much as each joint will appear as a diseased, swelled and tumid body, ready and ripe for incision. But mistake me not: I do not say that no glass presents the true picture of an object, but only that magnifying, multiplying, and the like optic glasses may and do oftentimes present falsely the picture of an exterior object. I say the picture because it is not the real body of the object which the glass presents, but the glass only figures or patterns out the picture presented in and by the glass, and there may easily mistakes be committed in taking copies from copies. Nay, artists do confess themselves that flies and the like will appear of several figures or shapes, according to the several reflections, refractions, mediums and positions of several lights; which if so, how can they tell or judge which is the truest light, position, or medium that does present the object naturally as it is? And if not, then an edge may very well seem flat and a point of a needle a globe; but if the edge of a knife or point of a needle were naturally and really so as the microscope presents them, they would never be so useful as they are; for a flat or broad plain-edged knife would not cut, nor a blunt globe pierce so suddenly another body; neither would or could they pierce without tearing and rending, if their bodies were so uneven; and if the picture of a young beautiful lady should be drawn according to the representation of the microscope, or according to the various refraction and reflection of light through such like glasses, it would be so far from being like her, as it would not be like a human face, but rather a monster, than a picture of nature. Hence those that invented microscopes and

such like dioptrical glasses at first did, in my opinion, the world more injury than benefit; for this art has intoxicated so many men's brains and wholly employed their thoughts and bodily actions about phenomena or the exterior figures of objects, as all better arts and studies are laid aside; nay, those that are not as earnest and active in such employments as they are, by many of them, accounted unprofitable subjects to the commonwealth of learning. But though there be numerous books written of the wonders of these glasses, yet I cannot perceive any such, at best, they are but superficial wonders, as I may call them. But could experimental philosophers find out more beneficial arts than our forefathers have done, either for the better increase of vegetables and brute animals to nourish our bodies, or better and commodious contrivances in the art of architecture to build us houses, or for the advancing of trade and traffic to provide necessaries for us to live, or for the decrease of nice distinctions and sophistical disputes in churches, schools and courts of judicature, to make men live in unity, peace and neighbourly friendship, it would not only be worth their labour, but of as much praise as could be given to them. But as boys that play with watery bubbles, or fling dust into each others eyes, or make a hobby-horse of snow, are worthy of reproof rather than praise for wasting their time with useless sports, so those that addict themselves to unprofitable arts spend more time than they reap benefit thereby. Nay, could they benefit men either in husbandry, architecture, or the like necessary and profitable employments, yet before the vulgar sort would learn to understand them, the world would want bread to eat and houses to dwell in, as also clothes to keep them from the inconveniences of the inconstant weather. But truly, although spinsters were most experienced in this art, yet they will never be able to spin silk, thread, or wool, &c. from loose atoms; neither will weavers weave a web of light from the sun's rays, nor an architect build a house of the bubbles of water and air, unless they be poetical spinsters, weavers and architects. And if a painter should draw a louse as big as a crab, and of that shape as the microscope presents, can anybody imagine

that a beggar would believe it to be true? But if he did, what advantage would it be to the beggar? For it does neither instruct him how to avoid breeding them, or how to catch them, or to hinder them from biting. Again: if a painter should paint birds according to those colours the microscope presents, what advantage would it be for fowlers to take them? Truly, no fowler will be able to distinguish several birds through a microscope, neither by their shapes nor colours; they will be better discerned by those that eat their flesh than by micrographers that look upon their colours and exterior figures through a magnifying-glass. In short, magnifying-glasses are like a high heel to a short leg, which if it be made too high is apt to make the wearer fall, and at best can do no more than represent exterior figures in a bigger and so in a more deformed shape and posture than naturally they are; but as for the interior form and motions of a creature, as I said before, they can no more represent them than telescopes can the interior essence and nature of the sun and what matter it consists of; for if one that never had seen milk before should look upon it through a microscope, he would never be able to discover the interior parts of milk by that instrument, were it the best that is in the world; neither the whey, nor the butter, nor the curds. Hence the best optic is a perfect natural eye and a regular sensitive perception, and the best judge is reason, and the best study is rational contemplation joined with the observations of regular sense, but not deluding arts. For art is not only gross in comparison to nature, but, for the most part, deformed and defective, and at best produces mixed or hermaphroditical figures, that is, a third figure between nature and art, which proves that natural reason is above artificial sense, as I may call it. Hence those arts are the best and surest informers that alter nature least, and they the greatest deluders that alter nature most, I mean the particular nature of each particular creature (for art is so far from altering infinite nature that it is no more in comparison to it than a little fly to an elephant, no not so much, for there is no comparison between finite and infinite). But wise nature taking delight in variety, her

parts, which are her creatures, must of necessity do so too.

*Chapter 37: Several Questions and Answers
Concerning Knowledge and Perception*

I am not ignorant that endless questions and objections may be raised upon one subject, and to answer them would be an infinite labour. But since I desire to be perspicuous in delivering my opinions, and to remove all those scruples which seem to obstruct the sense thereof, I have chosen rather to be guilty of prolixity and repetitions than to be obscure by too much brevity. And therefore I will add to my former discourse of knowledge and perception the resolution of these following questions, which, I hope, will render it more intelligible.

**Q. 1. WHAT DIFFERENCE IS THERE
BETWEEN SELF-KNOWLEDGE AND
PERCEPTION?**

I answer: There is as much difference between them as between a whole and its parts; or a cause and its effects; for though self-motion is the occasional cause of particular perceptions, by reason it is the cause of all particular actions of nature and of the variety of figures, yet self-knowledge is the ground or fundamental cause of perception. For were there not self-knowledge, there could not be perception, by reason perceptions are nothing else but particular exterior knowledges, or knowledges of exterior parts and actions, occasioned by the various compositions and divisions of parts; so that self-moving matter has a perceptive self-knowledge and consists of infinite parts, those parts having particular self-knowledges and perceptions, according to the variety of the corporeal figurative motions, which, as they are particular, cannot be infinite in themselves. For although a whole may know its parts, yet the parts cannot possibly know the whole, because an infinite may know a finite, but a finite cannot know an infinite. Nevertheless, when many parts are regularly composed,

those parts, by a conjunction or union of their particular self-knowledges and perceptions of each other, may know more and so judge more probably of infinite, as I have declared above; but as for single parts, there is no such thing in nature, no more then there can be an infinite part.

**Q. 2. WHETHER THE INANIMATE PART
OF MATTER MAY NOT HAVE SELF-
KNOWLEDGE AS WELL AS THE ANIMATE?**

I answer: In my opinion, and according to the conceptions of my sense and reason, the inanimate part of matter has self-knowledge as well as the animate, but not perception; for it is only the animate part of matter that is perceptive, and this animate matter being of a two-fold degree, sensitive and rational, the rational not being encumbered with the inanimate parts, has a more clear and freer perception than the sensitive, which is well to be observed. For though the rational, sensitive, and inanimate parts of matter make but one infinite self-moving body of nature, yet there are infinite particular self-knowledges, for nature is divided into infinite parts, and all parts of nature are self-knowing. But as all are not animate, so all are not perceptive, for perception, though it proceeds from self-knowledge, as its ground or principle, yet is also an effect of self-motion, for were there no self-motion, there would be no perception. And because nature is self-moving, all her parts are so too, and as all her parts are moving, so they have all compositions and divisions, and as all are subject to compositions and divisions, so all have variety of self-knowledge, so that no part can be ignorant. And by reason self-knowledge is the ground and principle of perception, it knows all the effects by the variety of their changes; therefore the inanimate part of matter may, for anything I know or perceive, be as knowing as the other parts of nature. For although it be the grossest part, and so the dullest, wanting self-motion, yet by the various divisions and compositions which the animate parts do make, the inanimate may be as knowing as the animate.

But some may say, if inanimate matter were knowing of itself, then it would also be sensible of itself. I answer that self-knowledge is so far sensible of itself that it knows itself, and therefore the inanimate part of matter being self-knowing, it may be sensible of its own self-knowledge. But yet it is not such a sense as self-moving matter has, that is, a perceptive sense; for the difference between animate and inanimate matter consists herein, that one is self-moving, and consequently perceptive, but the other not, and as animate matter is self-moving as well as self-knowing, so it is the chief and architectonical part of nature, which causes all the variety that is in nature. For without animate matter there could be no composition and division, and so no variety, and without inanimate matter there could not be such solid compositions of parts as there are, for the animate part of matter cannot be so gross as the inanimate. And therefore without these degrees there would be no variety of figures, nor no composition of solid figures, as animals, vegetables, minerals, &c. so that those effects which our sense and reason perceive could not be without the degrees of animate and inanimate matter. Neither could there be perception without animate matter, by which all the various effects of nature are perceived; for though one creature cannot perceive all the effects, yet the infinite parts of nature, by their infinite actions, perceive infinitely.

Again: Some may object that if the inanimate part of matter have self-knowledge and sense, it must of necessity have life also. To which I answer that the inanimate part of matter may have life, according as it has sense and knowledge, but not such a life as the animate part of matter has, that is, an active life, as to compose and divide the infinite body of nature into infinite parts and figures, and to produce infinite varieties of them, for all this cannot be without motion. Nevertheless, it has so much life as to know itself, and so much sense as to be sensible of its own self-knowledge. In short, the difference between animate and inanimate matter's life, sense and self-knowledge, is that the animate matter has an active life and a perceptive sense and self-knowledge, which

the inanimate part of matter has not because it wants self-motion, which is the cause of all actions and perceptions in nature.

**Q. 3. WHETHER THE INANIMATE
MATTER COULD HAVE PARTS WITHOUT
SELF-MOTION?**

I answer, Yes. For wherever is body or matter, there are also parts; because parts belong to body, and there can be no body without parts; but yet were there no self-motion, there could be no various changes of parts or figures. The truth is, nature considered as she is, and as much as our sense and reason can perceive by her various effects, must of necessity be composed or consist of a commixture of animate, both rational and sensitive, and inanimate matter. For were there no inanimate matter, there would be no ground or grosser substance to work on, and so no solid figures, and were there no animate sensitive matter, there would be no labourer, or workman, as I may call it, to form the inanimate part of matter into various figures; nor would there be such infinite changes, compositions, divisions, productions, dissolutions, &c. as we see there are. Again: were there no animate rational matter, there would be no designer or surveyor, to order and direct all things methodically, nor no fancies, imaginations, conceptions, memory, &c., so that this triumvirate of the degrees of matter is so necessary a constitutive principle of all natural effects, that nature could not be without it; I mean, nature considered, not what she might have been, but as she is, and as much as we are able to perceive by her actions. For Natural Philosophy is no more but a rational inquiry into the causes of natural effects; and therefore, as we observe the effects and actions of nature, so we may probably guess at their causes and principles.

**Q. 4. HOW CAN SO FINE, SUBTLE AND
PURE A PART AS THE ANIMATE MATTER**

**WORK UPON SO GROSS A PART AS THE
INANIMATE?**

I answer: More easily then vitriol, or aqua-fortis, or any other high extracts, can work upon metal, or the like; nay, more easily than fire can work upon wood, or stone, or the like. But you will say that, according to my opinion, these bodies are not wrought upon, or divided by the exterior agent, as by fire, vitriol, &c., but that they divide themselves by their own inherent self-motion, and that the agent is no more but an occasion that the patient moves or acts thus, or thus. I answer, 'tis very true. For there is such a commixture of animate and inanimate matter, that no particle in nature can be conceived or imagined which is not composed of animate matter as well as of inanimate; and therefore the patient, as well as the agent, having both a commixture of these parts of matter, none can act upon the other, but the patient changes its own parts by its own self-motion, either of its own accord, or by way of imitation. But the inanimate part of matter considered in itself, or in its own nature, has no self-motion, nor can it receive any from the animate; but they being both so closely intermixed, that they make but one self-moving body of nature, the animate parts of matter bear the inanimate with them in all their actions, so that it is impossible for the animate parts to divide, compose, contract, &c., but the inanimate must serve them, or go along with them in all such corporeal figurative actions.

**Q. 5. HOW IS IT POSSIBLE THAT PARTS
BEING IGNORANT OF EACH OTHER
SHOULD AGREE IN THE PRODUCTION OF
A FIGURE?**

I answer: When I speak of ignorance and knowledge, my meaning is, not that there is as much ignorance in the parts of nature as there is knowledge, for all parts have self-knowledge; but I understand a perceptive knowledge, by which parts do perceive parts. And as for the agreeing actions of parts, they cannot

readily err, unless it be out of wilfulness to oppose or cross each other: for put the case the sensitive parts were as ignorant of perceptions as the inanimate, yet the rational being thoroughly intermixed with them, would cause agreeable combinations and connections of parts in all productions, because they being not encumbered with the burdens of other parts, make more general perceptions than the sensitive, and moving freely in their own degree, there is a more perfect acquaintance between them than the sensitive parts, which is the cause that the rational design and order, whereas the sensitive labour and work; I mean, when they move regularly, or to one and the same effect, for then they must needs move agreeably and unitedly. But because the sensitive parts are perceptive as well as the rational, and perceive not only the rational adjoining parts but also those of their own degree, they cannot so grossly err, as some believe, especially since the sensitive parts do not only know their own work but are also directed by the rational. But as I have often said, the several sorts, both of the sensitive and rational perceptions, are well to be considered, which are as various as the actions of nature and cannot be numbered, by reason every figurative action is a several perception, both sensitive and rational, and infinite matter being in a perpetual motion, there must of necessity be infinite figures, and so infinite perceptions amongst the infinite parts of nature.

**Q. 6. WHETHER THERE BE SINGLE SELF-
KNOWLEDGES AND SINGLE PERCEPTIONS
IN NATURE?**

I answer: If there can be no such thing as a single part in nature, there can neither be a single self-knowledge or perception; for body and parts can never be separated from each other, but wherever is body, were it an atom, there are parts also; and when parts divide from parts, at the same time and by the same act, they are joined to other parts; so that composition and division are done by one act. The same for knowledge. For knowledge, being material, consists of parts, and as it

is impossible that there can be single parts, or parts subsisting by themselves, without reference to each other or the body of Nature, so it is impossible that there can be single knowledges. Neither can there be a single magnitude, figure, colour, place, &c., but all that is corporeal has parts, and by reason nature is a self-moving and self-knowing body, all her parts must of necessity be so too. But particular composed figures, and particular degrees of matter, are not single parts, nor are particular actions single actions, no more than a particular creature is a single part; for it would be nonsense to say single compositions and single divisions. And therefore particular and single are not one and the same, and as there can be no such thing as single in nature, so there can neither be single knowledges and perceptions, which is well to be observed, lest we introduce a vacuum in nature and so make a confusion between her parts and actions.

Q. 7. HOW IS IT POSSIBLE, SINCE THERE IS BUT ONE SELF-KNOWLEDGE IN NATURE, AS THERE IS BUT ONE SELF-MOTION, THAT THERE CAN BE A DOUBLE DEGREE OF THIS SELF-KNOWLEDGE, AS ALSO A DOUBLE PERCEPTION, VIZ. RATIONAL AND SENSITIVE?

I answer: As the several degrees of matter are not several kinds of matter, so neither are rational and sensitive knowledge several kinds of self-knowledges, but only different degrees of one self-knowledge; for as there is but one matter and one self-motion, so there is also but one self-knowledge in nature, which consists of two degrees, rational and sensitive, whereof the rational is the highest degree of self-knowledge, for it is a more pure, subtle, active and piercing knowledge than the sensitive, by reason it is not bound to work on and with the inanimate parts of matter, but moves freely in its own degree, whereas the sensitive is encumbered with labouring on the inanimate parts of matter. Indeed, there is as much difference between those two degrees of self-knowledge as between a chief

architect, designer or surveyor, and between a labourer or workman; for as the labourer and surveyor, though they be different particulars, are yet both of one kind, viz. mankind, so it is likewise with self-knowledge. For were matter divided into infinite degrees, it would still remain matter, and though self-motion be divided into infinite degrees of motions, yet it is still but self-motion. The same for self-knowledge: for self-moving matter can but know itself, and as matter is the ground or constitutive principle of all the parts and figures in nature (for without matter there could be no parts and so no division) and self-motion is the ground or principle of all particular actions, so is self-knowledge the ground of all particular knowledges and perceptions. Again: as one part cannot be another part, so neither can one part's knowledge be another part's knowledge, although they may have perceptions of each other. When I speak of parts, I mean not single parts; for there can be no such thing as a single part in nature, but by parts I understand particular self-moving figures, whether they be such composed figures as, for distinction's sake, we call finite wholes; as for example an animal, a tree, a stone, &c. or whether they be parts of those finite figures. For it is impossible to describe or determine exactly what the parts of nature are, by reason nature, although it is but one body, yet being self-moving, is divided into infinite figures, which by self-motion are infinitely changed, composed, dissolved, &c., which compositions and divisions hinder that there can be no single parts, because no part, though it should be infinitely changed, composed and divided, can be separated from the body of nature, but as soon as it is divided from such parts, it is composed with other parts. Nay, were it possible that it might be separated from the body of nature, it would not be a part then, but a whole; for it would have no reference to the body of nature; besides, if it continued body, or matter, it would still have parts, for wherever is body, there is a composition of parts.

But if anyone desires to know or guess at the parts of nature, he cannot do it better than by considering the corporeal figurative motions or actions of nature;

for what we name parts are nothing but the effects of those figurative motions, so that motions, figures and parts are but one thing. And it is to be observed that in composed figures there are interior and exterior parts; the exterior are those which may be perceived by our exterior senses, with all their proprieties, as colour, magnitude, softness, hardness, thickness, thinness, gravity, levity, &c., but the interior parts are the interior, natural, figurative motions, which cause it to be such or such a part or creature; as for example, man has both his interior and exterior parts, as is evident, and each of them has not only their outward figure or shape, but also their interior, natural, figurative motions, which did not only cause them to be such or such parts, as for example a leg, a head, a heart, a spleen, a liver, blood, &c., but do also continue their being. The only difference is, that those figurative motions, which did first form or produce them, afterwards, when they were finished, became retentive motions. By retentive motions, I do not only mean such as keep barely the parts of the composed figures together, but all those that belong to the preservation and continuance of them, under which are included digestive motions, which place and displace parts; attractive motions, which draw nourishment into those parts; expulsive motions, which expel superfluous and hurtful parts; and many the like; for there are numerous sorts of retentive motions, or such as belong to the preservation and continuance of a composed figure, as well as there are of creating or producing motions. By which we may plainly see that one figure lies within another; that is, one corporeal figurative motion is within another, and that the interior and exterior parts or figures of creatures are different in their actions. For example, the ebbing and flowing, or the ascending and descending motions of water, are quite different from those interior figurative motions that make it water; the same may be said of vegetables, minerals, animals, and all other sorts of creatures; nay, though both the interior and exterior parts, figures or motions do make but one composed figure or creature, as for example, man, and are all but parts of that same

figure, yet each being a particular motion has also its peculiar self-knowledge and perception. For the difference of particular knowledges and perceptions depends upon the difference of nature's actions, which as by the division of parts they cause an ignorance between them, so by composition they cause also perceptions. I do not mean an interior or self-ignorance, which cannot be in nature, by reason every part and particle has self-knowledge, but an exterior, that is, an ignorance of foreign parts, figures or actions, although they be parts of one composed figure; for the parts of the hand do not know the parts of the stomach, and their actions. Neither do I mean an interior self-perception, which can neither be in nature, because perception presupposes ignorance, and if there cannot be a self-ignorance, there can neither be a self-perception, although there may be an interior self-knowledge. Nor is it proper to say, a part may perceive itself, or have a perception of itself, but by perception I mean an exterior or foreign knowledge, that is, a knowledge of other parts, figures, or actions. These perceptions, I say, are different, according to the difference of the corporeal figurative motions; for it is impossible that such or such parts should have such or such perceptions, if they have not such or such corporeal motions. Therefore though all parts have self-knowledge as well as self-motion, yet by reason all parts do not move alike, they cannot make the like perceptions; and though self-knowledge, as it is the ground and fountain not only of all particular knowledges, but also of all exterior perceptions, is but one in itself, as a fixed being, and cannot be divided from its own nature (for as matter cannot be divided from being matter, or self-motion from being self-motion, so neither can self-knowledge be divided from being self-knowledge, nor can they be separated from each other, but every part and particle of natural matter has self-knowledge and perception, as well as it has self-motion), yet all this hinders not, but there may be degrees of self-knowledge according to the degrees of matter. For as there is rational and sensitive matter, so there is also rational and sensitive self-knowledge; nay, there are infinite particular self-knowledges and

perceptions, according to the infiniteness of parts and motions, and yet all is but one self-moving and self-knowing nature; for parts are nothing else but a division of the whole, and the whole is nothing else but a composition of parts. All which I desire may be taken notice of, lest my sense be misinterpreted, for when I speak of rational and sensitive self-knowledge, I do not mean as if there were more self-knowledge than one in the only infinite matter, to wit, a double kind of self-knowledge, but I speak in reference to the parts of matter. For the rational part is more pure and so more agile, quick and free than the sensitive, and the animate part is self-knowing, but the inanimate not: and thus in respect to parts, as they are divided, so they have several self-knowledges and perceptions, as also numerous lives and souls in one composed figure or creature; and as infinite parts belong to one infinite whole, so infinite self-knowledges and infinite perceptions belong to the infinite actions of those infinite parts. But some may ask, Why are there no more degrees of matter but two, viz. animate, and inanimate, and no more degrees of animate, but rational, and sensitive? I answer: Human sense and reason cannot conceive it possible there should be more or fewer; for the rational and sensitive are the purest degrees matter can be capable of, and were there any purer than these, they would be beyond the nature of matter, which is impossible because nature cannot go beyond itself. Again: some may perhaps desire to know, why there are more degrees of inanimate matter than of animate, to wit, of thickness and thinness, rarity and density, lightness and heaviness, &c? I answer: These are nothing else but the actions of the material parts and do not belong to the nature of matter, so that they cannot make parts less or more material, for all is but matter; neither can they alter the nature of matter, for matter is still matter, however it moves. Lastly, some may ask, How is it possible that such an infinite variety can proceed but from two degrees of matter, to wit, animate and inanimate? I answer: As well as infinite effects can proceed from one infinite cause; for nature being an infinite body must also have infinite parts; and

having an infinite self-motion, must of necessity have an infinite variety of parts; and being infinitely self-knowing, must also have infinite self-knowing parts. Which proves that nature's body must of necessity consist of those two degrees, viz. animate and inanimate matter, for were there no animate matter, which is corporeal self-motion, there would never be such variety of figures, parts and actions in nature as there is, nor any perceptions; for self-knowledge, or matter, without self-motion, could never make any variety in nature. And therefore although self-motion causes an obscurity by the division of parts, yet it causes also particular perceptions between parts, and as the motions vary, so do perceptions of parts. In short, there is but one infinite body and infinite parts; one infinite self-knowledge and infinite particular self-knowledges; one infinite self-motion and infinite particular actions; as also infinite particular perceptions: for self-motion is the cause of all the variety of nature, and as one figure or part of nature lies within another, so one perception is within another.

Q. 8. HOW CAN THERE BE SELF-KNOWLEDGE AND PERCEPTION IN ONE AND THE SAME PART?

I answer: As well as the being or substance of a thing and its actions can consist together, or as a cause and its effects; for though they are so far different from each other, that the cause is not the effect, nor the effect the cause; as also that the effect must of necessity depend upon the cause, but the cause may choose whether it will produce such or such effects; as for example, though action or motion depends upon matter, yet matter does not depend upon motion, as being able to subsist without it; and though perception depends upon self-knowledge, yet self-knowledge does not depend upon perception. Nevertheless, wherever is perception, there is also self-knowledge, by reason wherever there is an effect in act or being, there is also its cause; and although perception depends also upon outward objects, yet outward objects do not depend

upon perceptions; but perception, as it depends upon self-knowledge, so it depends also upon self-motion, for without self-knowledge and self-motion there would be no perception; so that both exterior perceptions and all interior voluntary actions proceed from self-knowing and self-moving matter, but the difference between particular interior self-knowledges and perceptions is caused by the changes of corporeal, figurative self-motion.

Q. 9. WHETHER PARTICULAR PARTS OR FIGURES ARE BOUND TO PARTICULAR PERCEPTIONS?

I answer: Particular parts make perceptions, according to the nature of their corporeal, figurative motions, and their perceptions are as numerous as their actions. For example, those parts that are composed into the figure of an animal make perceptions proper to that figure's corporeal, interior, natural motions, but if they be dissolved from the animal figure and composed into vegetables, they make such perceptions as are proper for vegetables, and being again dissolved and composed into minerals, they make perceptions proper to minerals, &c., so that no part is tied or bound to one particular kind of perception, no more than it is bound to one particular kind of figure. But when the interior motions of that figure change, the perceptions proper to that same figure change also; for though self-knowledge, the ground of all perceptions, is a fixed and inherent or innate knowledge, yet the perceptions vary according to their objects and according to the changes and compositions of their own parts; for as parts are composed with parts, so are their perceptions. Nay, not only perceptions, but also particular self-knowledges alter according to the alteration of their own parts or figures, not from being self-knowledge, for self-knowledge can be but self-knowledge, but from being such or such a particular self-knowledge. And since there is no part or particle of nature but is self-knowing or has its particular self-knowledge, it is certain that as the interior nature of the figure alters by the changes of motion, the

interior self-knowledge of that figure alters too; for if a vegetable should turn into a mineral, it cannot retain the self-knowledge of a vegetable but it must of necessity change into the self-knowledge of a mineral; for nothing can have a knowledge of itself otherwise than what it is. And because self-knowledge is the ground of perception, as self-knowledge alters so does perception; I mean, that kind of perception that belonged to such a figure, alters to another kind of perception proper to another figure; so that it is with perception as it is with other creatures. For example, as there are several kinds of creatures, such as elements, animals, minerals, vegetables, &c., so there are also several kinds of perceptions, such as animal, vegetative, mineral, elemental perception; and as there are different particular sorts of these mentioned kinds of creatures, so there are also of perceptions. Nay, as one particular creature of these sorts consists of different parts, so every part has also different perceptions; for self-motion, as it is the cause of all the various changes of figures and parts of nature, so it is also of the variety of perceptions. For put the case matter were of one infinite figure, it would have but self-knowledge, or at least no variety of perceptions, because it would have no variety of corporeal figurative motions; and it is well to be observed that although numerous different parts may agree in perception, that is, their sensitive and rational figurative motions may all perceive one and the same object, yet the manner of their perceptions are different, according to the difference of their figures, or rather of their interior, corporeal, figurative motions. For example, a man, a tree, and a stone, may all have perceptions of one object, but yet their perceptions are not alike, for the tree has not an animal or mineral, but a vegetative perception; and so has the man, not a vegetative or mineral, but an animal perception; and the stone, not an animal or vegetative, but a mineral perception, each according to the interior nature of its own figure.

Q. 10. WHETHER THERE COULD BE SELF-KNOWLEDGE WITHOUT PERCEPTION?

I answer: Self-knowledge being the ground of all perceptions, which are nothing else but exterior knowledges, might as well subsist without them, as matter would subsist without motion; but since self-motion is the cause of all the various changes of figures and parts, and of all the orderly productions, generations, transformations, dissolutions, and all other actions of nature, these cannot be performed without perception. For all actions are knowing and perceptive, and were there no perception, there could not possibly be any such actions; for how should parts agree either in the generation, composition or dissolution of composed figures, if they had no knowledge or perception of each other? Therefore, although self-knowledge is a fixed interior being and the ground of all perceptions, yet were there no self-motion, there could be no action and consequently no perception, at least no variety of perceptions in nature. But since nature is one self-moving and self-knowing body, self-knowledge can no more be separated from perception than motion can be divided from matter, but every part and particle of nature, were it an atom, as it is self-moving, so it is also self-knowing and perceptive. But yet it is not necessary that perception must only be between neighbouring or adjoining parts, for some parts may very well perceive each other at a distance, and when other parts are between; nay, some perceptions do require a distance of the object, as for example the optic perception in animals, as I have declared before, where I do mention the requisites of the animal perception of sight, whereof if one be wanting, there is either no perception at all (I mean, no perception of seeing in that animal) or the perception is imperfect. But some may ask, in such a case, that is, in the perception of an object which is distant from the sentient, are the intermediate parts as well perceived as the object itself to which the perception directly tends? I answer that if the intermediate parts be subject to that kind of perception, they may as well be perceived as the object that is distant; nay, sometimes better, but most commonly

the intermediate parts are but slightly or superficially perceived. For example, in the aforementioned sense of seeing, if the organ of sight be directed to some certain object that is distant, and there be some parts between the organ and the object perceptible by the same sense, but such as do not hinder or obstruct the perception of the said object, not only the object, but also those intermediate parts will be perceived by the optic sense. Also, if I cast my eye upon an object that is before me in a direct line, the eye will not only perceive the object to which it is chiefly directed, but also those parts that are joined to it, either beneath or above or on each side of that object, at the same point of time and by the same act; the sole difference is that the said object is chiefly and of purpose patterned out by the sensitive and rational figurative motions of the eye, whereas the other intermediate or adjoining parts are but superficially and slightly looked over.

And this proves, first, that nature is composed of sensitive, rational and inanimate matter, without any separation or division from each other; for could matter be divided into an atom, that very atom would have a composition of these three degrees of matter; and therefore, although the parts of nature do undergo infinite divisions and compositions, so that parts may be composed and divided infinite ways, yet these three degrees can never be separated or divided from one another because of their close union and commixture through infinite nature.

Next it proves that there can be no single parts in nature, for what commonly are called parts of nature are nothing else but changes of motion in the infinite body of Nature; so that parts, figures, actions, and changes of motion are one and the same, no more differing from each other than body, place, magnitude, figure, colour, &c. For self-motion is the cause of the variety of figures and parts of nature, without which, although there would nevertheless be parts (for wherever is matter or body there are parts also), yet nature would be but a confused heap or chaos, without the distinction of any perfect figures, which figures make perfect perceptions of perfect objects. I say of perfect objects, for if the objects

be not perfect, the sensitive perceptions can neither be perfect, but then the rational being joined with the sensitive, and being more subtle, active and piercing, may find out the error either of the object, or sense; for both the rational and sensitive parts being united in one figure or action can more easily perceive the irregularities of each other's actions than of exterior objects. All of which could not be were there single parts in nature, neither could such acts be performed by chance or senseless atoms; nay, could there be any single parts in nature, there would consequently be a vacuum to discern and separate them from each other, which vacuum would breed such a confusion amongst them, as there would be no conformity or symmetry in any of their figures. Therefore I am absolutely against the opinion of senseless and irrational atoms moving by chance; for if nature did consist of such atoms, there would be no certain kinds and species of creatures, nor uniformity or order; neither am I able to conceive how there could be a motion by chance, or an irrational and senseless motion, no more than I can conceive how motion can be without matter or body; for self-motion, as it is corporeal, so it is also sensitive and rational.

Q. 11. WHETHER PERCEPTION BE MADE BY PATTERNING?

I answer: My sense and reason do observe that the animal, at least human perception, performed by the sensitive and rational motions in the organs appropriated for it, is made by patterning or framing of figures, according to the patterns of exterior objects; but whether all other kinds and sorts of perceptions in the infinite parts of nature be made the same manner or way, neither myself nor no particular creature is able to determine, by reason there are as many various sorts of perceptions as there are of other actions of nature, and according as the corporeal figurative motions do alter and change, so do particular perceptions. For perception is a corporeal, figurative action and is generally in all parts and actions of nature, and as no part can be without self-motion and self-knowledge, so none can be without perception;

and therefore I dare truly say that all perceptions are made by figuring, though I cannot certainly affirm that all are made by imitation or patterning. But it is well to be observed that besides those exterior perceptions of objects, there are some other interior actions both of sense and reason which are made without the presentation of exterior objects, voluntarily, or by rote, and therefore are not actions of patterning, but voluntary actions of figuring. As for example, imaginations, fancies, conceptions, passions, and the like are made by the rational, corporeal, figurative motions, without taking any copies of foreign objects; also many generations, dissolutions, alterations, transformations, &c. are made by the sensitive motions without any exterior patterns. For the generation of maggot in a cheese, of a worm in the root of a tree, of a stone in the bladder, &c. are not made by patterning or imitation, because they are not like their producers, but merely by a voluntary figuring; and therefore it is well to be observed that figuring and patterning are not one and the same. Figuring is a general action of nature, for all corporeal actions are figurative, whereas patterning is but a particular sort of figuring. And although I observe that some perceptions are made by patterning, yet I cannot say the same of all; neither are the interior voluntary actions made by patterning, but both the sensitive and rational motions frame such or such figures of their own accord. For though each part in the composition of a Creature knows its own work, and all do agree in the framing and producing of it, yet they are not necessitated always to imitate each other, which is evident because the composition of one and the same creature is various, and different by reason of the variety of its parts.

And this is the difference between exterior perceptions and interior voluntary actions, for though both are effects of self-knowledge and self-motion, yet perceptions are properly concerning foreign parts, figures and actions, and are occasioned by them; but the voluntary actions are not occasioned by any outward objects, but make figures of their own accord, without any imitation, patterns or copies of foreign parts or actions. And as the figures and parts alter by their

compositions and divisions, so do both interior and exterior particular knowledges, for a tree, although it has sensitive and rational knowledge and perception, yet it has not an animal knowledge and perception, and if it should be divided into numerous parts, and these again be composed with other parts, each would have such knowledge and perception as the nature of their figure required. For self-knowledge alters as their own parts alter, perception alters as the objects alter, figures alter as the actions alter, and the actions alter as nature pleases, or is decreed by God to work.

But I desire it may be observed, first, that although there are both voluntary actions of figuring, and occasioned actions of perceiving exterior objects, both in sense and reason, whereof those I call interior, these exterior, yet both of them are innate and inherent actions of their own parts, as proceeding from the ground and fountain of self-knowledge. And the reason why I call the voluntary actions interior, is because they have no such respect to outward objects, at least are not occasioned by them as perceptions are, but are the own figurative actions of sense and reason made by rote, whereas perceptions do tend to exterior objects and are made according to the presentation of their figures, parts or actions.

Next, it is to be observed that many times the rational motions take patterns from the sensitive voluntary figures, as for example in dreams, when the sensitive motions make voluntary figures on the inside of the sensitive organs, the rational take patterns of them, and again the sensitive do many times take patterns of the rational when they make figures by rote, as in the invention and delivery of arts and sciences. Thus there is oftentimes an imitation between the rational and sensitive motions, for the rational voluntary figures are, like exterior objects, to be patterned out by the sensitive perceptive motions, and the sensitive voluntary figures are, like exterior objects, to be patterned out by the rational perceptive motions, and yet all their perceptive actions are their own and performed inwardly, that is, by their own motions. Which proves that by naming perception an exterior action, I do not mean that it is an action exteriorly perceptible or visible; for if it were thus, then one part would presently know

another part's perception, when and how it perceives, which we find it does not. For although a man perceives a tree, or stone, yet he does not know whether the tree or stone perceives him, much less what perceptions they make. But, as I said before, perception I name an exterior action, because it is occasioned by an object that is without the perceiving parts, for although both sensitive and rational perception are so closely intermixed, that none can be without the other in every part or particle of nature, were it no bigger then what is called an atom, yet considered in themselves, they are without each other so far, that the rational perceptive part is not the sensitive, nor the sensitive the rational, or else they would not be several parts or actions, neither would there be any imitation between them.

Lastly, I desire that notice may be taken when I say that every action of nature is perceptive; for since there are no single parts in nature, but whatever is body consists of parts, there can neither be any such thing as a single action, that is an action of a single part, but in all natural actions there is a commerce, intercourse, or agreement of parts, which intercourse or agreement cannot be without perception of knowledge of each other. Hence it must of necessity follow that every action is perceptive, or that perception between parts is required in every action of nature, nay, even in those which are called voluntary actions. For though the rational and sensitive parts of a composed figure, can make voluntary figures within themselves, without taking any patterns of foreign objects, yet those parts must needs know and perceive each other even in the composition or framing of their voluntary figures, so that exterior knowledge or perception is as universal as self-motion; for wherever is self-motion, there is perception also. But it is well to be observed, first, that perception or perceptive knowledge is only between parts; next, that although every action in nature is perceptive, yet not every action is the action of perception properly so called, which perception, in composed figures, at least in animals, is an action of patterning out exterior parts or objects performed by the rational and sensitive corporeal figurative motions in their proper organs. But there are Infinite other actions, which

although they require perceptive parts, yet they are not such actions of perceptions as are made by patterning out or imitating outward objects; as for example respiration, digestion, contraction, dilation, expulsion, generation, retention, dissolution, growth, decay, &c. Nevertheless, all those actions are perceptive, that is, the parts which perform those actions have perception of each other, or else they would never agree to produce such effects. The truth is, that even the action of perception properly so called presupposes many particular perceptions between those parts that concur to the performance of that act; for it is impossible that both the rational and sensitive parts in a composed figure should make the act of perception without they know and agree what they are to do and how they are to perform it, as I mentioned before. And this is the reason that I have made a difference between perception and respiration and called them different actions; not as if respiration was not a perceptive action or presupposes not knowledge and perception between those parts that make respiration; but it is not the action of perception properly so called, as for example the perception of seeing, hearing, smelling, tasting, &c. in animals, but it is properly an action of drawing, sucking, breathing in, or receiving any ways outward parts, and of venting, discharging or sending forth inward parts. Nevertheless, all this cannot be done without perception or knowledge, no more than without motion; for wherever is motion, there is perception also, and therefore respiration is a perceptive action. In short, I desire it may be observed, 1. that there is perception in every action, but that not every perception is made by patterning; 2. that all self-moving parts are perceptive; 3. that perception, perceptive knowledge, and exterior knowledge are all one thing, and that I take them indifferently; 4. that all voluntary actions, both of sense and reason, are made by perceptive parts, and therefore when I make a distinction between voluntary actions and perceptions, I mean the perceptions of a composed figure and not the particular perceptive knowledges between those parts that join in the act of such perceptions or in the making of voluntary figures.

But it may be objected, that if all motions were perceptive, they would be wholly employed in nothing else but in making copies of exterior parts or objects.

My answer is, although I say that all motions are perceptive, yet I do not positively affirm that all perceptions in nature are made by patterning or imitation; for we are to consider that there are as many different sorts of perceptions as there are of motions, because every particular motion has a particular perception, and though in a composed figure or creature some motions may work to the patterning out of exterior objects, yet all the rest may not do so and be nevertheless perceptive. For like as a man, or any other animal creature, is not altogether composed of eyes, ears, noses, or the like sensitive organs, so not all perceptive motions are imitating or patterning, but some are retentive, some expulsive, some attractive, some contractive, some dilative, some creating or producing, some dissolving, some imitating or patterning, and so forth; and as there are degrees of parts and motions, so some perceptions may be so much purer, finer, and subtler than others, as much as pure air is beyond gross earth. The truth is, we cannot judge of nature's actions any other way than by observing them by our own sensitive and rational perceptions, and since we find that the sensitive and rational motions in our sensitive organs do work by way of patterning or imitation, we may surely conclude that some perceptions are made that way. But that all other perceptions in all natural parts or creature should be made after the same manner would be too presumptuous for any particular creature to affirm, since there are infinite several sorts of perceptions. And although we may justly and with all reason believe that all parts of nature are perceptive because they are self-moving and self-knowing, yet no particular creature is able to judge how and in what manner they perceive, no more than it can know how they move. And by this it is evident how in one and the same organ of the eye, some motions or parts may work to the act of perception, properly so called, which is made by patterning out the figure of an exterior object, and other motions or parts may work to the retention of the eye, and preserving it in its being, others again may work to

its shutting and opening, and others to its respiration, that is, venting of superfluous, and receiving of nourishing parts, which motions are properly subservient to the retentive motions and hundreds the like. And yet all these motions are as knowing and perceptive after their way as those that work to the act of perception, properly so called, that is, to the act of seeing, made by patterning or imitation. But it is well to be observed that although the eye has the quickest action in the perception of seeing, yet is this action most visible not only by its motions but by the figures of the objects that are represented in the eye. For if you look into another's eye, you will plainly perceive therein the picture of your own figure, and had other objects but such an optic perception as animals, they would, without question, observe the same. Some will say that those figures in the eye are made by reflection, but reflections cannot make such constant and exact patterns or imitations; others believe it proceeds from pressure and reaction, but pressure and reaction, being but particular actions, cannot make such variety of figures. Others again say that the species of the objects pass from the objects to the optic organ and make figures in the air, but then the multitude of those figures in the air would make such a confusion as would hinder the species' passing through; besides, the species being corporeal, and proceeding from the object, would lessen its quantity or bulk. Thus my opinion is that the most rare and subtlest parts in the animal sensitive organs do pattern out the figures of exterior objects, and that the perception of the exterior animal senses, that is, sight, hearing, tasting, touching, smelling, is certainly made by no other way than by figuring and imitation.

Q. 14. HOW IS IT POSSIBLE THAT ANY PERCEPTION OF OUTWARD OBJECTS CAN BE MADE BY PATTERNING, SINCE PATTERNING DOES FOLLOW PERCEPTION; FOR HOW CAN ANY ONE PATTERN OUT THAT WHICH HE HAS NO PERCEPTION OF?

I answer: Natural actions are not like artificial ones, for art is but gross and dull in comparison to nature; and

although I allege the comparison of a painter, yet is it but to make my meaning more intelligible to weaker capacities. For though a painter must see or know first what he intends to draw or copy out; yet the natural perception of exterior objects is not altogether after the same manner, but in those perceptions which are made by patterning, the action of patterning, and the perception, are one and the same; for as self-knowledge is the ground of perception, so self-motion is the action of perception, without which no perception could be, and therefore perception and self-action are one and the same. But I desire, that it may well be observed what I have mentioned heretofore, to wit, that although there is but one self-knowledge and one self-motion in nature, yet they being material are dividable; and therefore as from one infinite cause there may flow infinite effects, and one infinite whole may be divided into infinite parts, so from one infinite self-knowledge and self-motion there may proceed infinite particular actions and perceptions.

But some may perhaps ask, 1. Why are those particular knowledges and perceptions not all alike, as being all but effects of one cause? To which I answer that if the actions or motions of nature were all alike, all parts would have the like knowledges and perceptions; but the actions being different, how can it be otherwise but the perceptions must be different also? For since every perception is a particular self-action, then as the actions of nature vary and as parts do divide and compose, so are likewise their perceptions.

2. It may be objected that if the perception of the exterior senses in animals be made by way of patterning, then when a part of the body feels pain, the rational motions by patterning out the same would be pained or sick.

I answer: This does no more follow than that the eye patterning out the exterior figure of water, fire, earth, &c. should become of the same nature; for the original is one thing and the copy another: the picture of a house of stone is not made of natural stone, nor is the picture of a tree a natural tree; for if it were so, painters would do more than chemists do by fire and furnace; but

by reason there is a very close conjunction between the rational and sensitive perceptive motions, so that when the sensitive motions of the body pattern out some exterior object, the rational most commonly do the same. That which we call pain or sickness in the body, when patterned out by the mind, is called trouble or grief; for as there are degrees in their purity, subtlety and activity, so their perceptions are also different. But it is well to be observed that although some parts are ignorant of others, when they work not to one and the same perception, yet sometimes there is a more general knowledge of a disease, pain, or soreness; for example, a man may have an inflammation or soreness in one part of his arm or leg, and all the rest of the parts of that limb may be ignorant thereof; but if the inflammation, soreness or pain extend throughout the whole arm or leg, then all the parts of that limb are generally sensible of it.

3. It may be objected that if the rational perceptive motions take patterns from the sensitive, then reason can never judge of things as naturally they are but only of their copies, as they are patterned out by the sensitive motions.

I answer, first, that reason is not so necessitated as to have no other perception than what sense presents; for reason is the instructor and informer of sense, as an architect or surveyor is in the construction of a house. Next, I say, that in the act of perception, reason does not only perceive the copies of the senses, but it perceives with the sense also the original; for surely the rational part of matter, being intermixed with the sensitive, must perceive as well the original, as sense does; for it is not so involved within the sensitive that it cannot peep out, as a Jack-in-a-box; but both being closely intermixed, one makes perceptions as well as the other, as being both perceptive, and by reason the rational part makes the same perception as the sensitive does, it seems as if the rational did take copies from the sensitive, which although it does, yet this does not hinder it from making a perception also of the original.

But then some may say, if the rational part has liberty to move as it will, then it may perceive without sense; that is, reason may make perceptions of outward

objects in the organs of the senses when the senses make none; as, for example, the rational motions in the eye may perceive light when the sensitive do not, and sound in the ear when the sensitive do not.

To which I answer, 'tis probable that the rational do many times move to other perceptions than the sensitive, as I have often declared; but if their actions be orderly and regular, then most commonly they move to one and the same perception, but reason being the purer and freer part, has a more subtle perception than sense. For there is great difference between sense and reason, concerning the subtlety of their actions: sense does perceive, as it were, in part, whereas reason perceives generally and in whole; for if there be an object which is to be patterned out with all its proprieties, the colour of it is perceived only by sight, the smell of it is perceived by the nose, its sound is perceived by the ear, its taste is perceived by the tongue, and its hardness or softness, coldness or heat, dryness or moisture, is perceived by touch. So that every sense in particular patterns out that object which is proper for it, and each has but so much knowledge of the said object as it patterns out; for the sight knows nothing of its taste, nor the taste of its touch, nor the touch of its smell, and so forth. But the mind patterns out all those figures together, so that they are but as one object to it, without division, which proves that the rational perception, being more general, is also more perfect than the sensitive, and the reason is because it is more free and not encumbered with the burdens of other parts. Hence the rational can judge better of objects than the sensitive, as being more knowing, and knows more because it has a more general perception, and has a more general perception because it is more subtle and active, and is more subtle and active because it is free and not necessitated to labour on or with any other parts.

But some may say, how is it possible that the rational part, being so closely intermixed with the sensitive and the inanimate, can move by itself, and not be a labourer, as well as the sensitive?

I answer: The reason is, because the rational part is more pure and finer than the sensitive, or any other

part of matter, which purity and fineness makes that it is so subtle and active, and consequently not necessitated to labour with or on other parts.

Again: Some may ask, whether those intermixed parts continue always together in their particulars? As for example, whether the same rational parts keep constantly to the same sensitive and inanimate parts, as they are commixed?

I answer: Nature is in a perpetual motion, and her parts are parts of her own self-moving body; hence they must of necessity divide and compose, but if they divide and compose they cannot keep constantly to the same parts. Nevertheless, although particular parts are dividable from each other, yet the triumvirate of nature, that is, the three chief degrees or parts of matter, to wit, rational, sensitive and inanimate, which belong to the constitution of nature, cannot be separated or divided from each other in general; so that rational matter may be divided from sensitive and inanimate, and these again from the rational, but they must of necessity continue in this commixture as long as nature lasts. In short, rational, sensitive and inanimate matter are dividable in their particulars; that is, such a particular part of inanimate matter is not bound to such a particular part of sensitive or rational matter, &c., but they are undividable in general, that is, from each other; for wherever is body, there is also a commixture of these three degrees of matter.

4. Some may say, how is it possible that reason can be above sense, and that the rational perception is more subtle and knowing than the sensitive, since in my *Philosophical Opinions* I have declared that the sensitive perception does inform the rational, or that reason perceives by the information of the senses?

To which I answer: My meaning is not that reason has no other perception but by the information of the senses; for surely the rational perception is more subtle, piercing and penetrating, or inspective, than the sensitive, and therefore more intelligent and knowing; but when I say that sense informs reason, I speak only of such perceptions where the rational figurative motions take patterns from the sensitive and do not work voluntarily or by rote.

Besides, it is to be observed that in the mentioned book, I compare thoughts, which are the actions of the rational figurative motions, to the sensitive touch, so that touch is like a thought in sense, and thought like a touch in reason. But there is great difference in their purity, for though the actions of touch and thought are much after the same manner, yet the different degrees of sense and reason, or of animate, sensitive and rational matter, cause great difference between them; and as all sensitive perception is a kind of touch, so all rational perception is a kind of thoughtfulness. But mistake me not when I say thought is like touch, for I do not mean that the rational perception is caused by the conjunction or joining of one part to another, or that it is an exterior touch, but an interior knowledge, for all self-knowledge is a kind of thoughtfulness, and that thought is a rational touch, as touch is a sensitive thought; for the exterior perceptions of reason resemble the interior actions or knowledge of sense. Neither do I mean that the perception of touch is made by pressure and reaction, no more than the perception of sight, hearing, or the like; but the patterns of outward objects being actions of the body sentient are, as it were, a self-touch or self-feeling, both in the sensitive and rational perceptions. Indeed that subtle and learned philosopher, who will persuade us that perception is made by pressure and reaction, makes perception only a phantasm. For, says he, reaction makes a phantasm and that is perception.

5. Some perhaps will say that if the perception of the exterior animal senses be made by patterning, then that animal which has two or more eyes, by patterning out an exterior object, will have a double or triple perception of it, according to the number of its eyes.

I answer that when the corporeal motions in each eye move irregularly, as for example when one eye moves this, and the other another way, or when the eyes look askint, then they do not pattern out the object directly as they ought; but when the eyes move regularly, then they pattern out one and the same object alike, as being fixed but upon one point. And the proof thereof is, if there be two eyes, we may observe that both have their perceptions apart as well as jointly; because those parts that are in the middle of each eye do not make at

the same time the same perceptions with those that are the side or extreme parts thereof, but their perceptions are different from each other. For example, the eyes of a man, or some other animal, pattern out a tree which stands in a direct line opposite to them; but if there be meadows or hedges on each side of the tree, then the extreme or side parts of each eye pattern out those meadows or hedges; for one eye's perception is not the other eye's perception, which makes them perceive differently when otherwise they would perceive both alike. But if a thousand eyes do perceive one object just alike, then they are but as one eye and make but one perception; for like as many parts do work or act to one and the same design, so do several corporeal motions in one eye pattern out one object; the only difference is that, as I said, every eye is ignorant of each other's perception.

But, you'll say, there are so many copies made as there are objects.

I answer: 'Tis true. But though there are many composed parts which join in the making of one particular perception; yet if they move all alike, the perception is but one and the same: for put the case there were a hundred thousand copies of one original; if they be all alike to each other, so as not to have the least difference between them, then they are all but as one picture of one original; but if they be not alike to each other, then they are different pictures because they represent different faces. And thus for a matched pair of eyes in one creature, if they move at the same point of time, directly to one and the same parts, in the same design of patterning out one and the same object, it seems but as one act of one part and as one perception of one object.

...

And thus much of knowledge and perception, which since it is not only the ground of Natural Philosophy but a subject of a difficult nature, I have insisted somewhat longer upon it than I have done upon any other, and endeavoured to clarify it as well as I could; so that now, I hope, all that I have declared hitherto will be sufficient to give the ingenious reader a true information of my

opinion thereof and a satisfactory answer to any other scruples that should happen to puzzle his brain. I'll add no more at this time, but conclude with a brief repetition of those few notes concerning the principles which by that small portion of reason and judgment that nature has allowed me, I have endeavoured to declare and prove in my works of Natural Philosophy.

1. There is but one matter, and infinite parts; one self-motion, and infinite actions; one self-knowledge, and infinite particular knowledges and perceptions.
2. All parts of nature are living, knowing, and perceptive, because all are self-moving, for self-motion is the cause of all particular effects, figures, actions, varieties, changes, lives, knowledges, perceptions, &c. in nature, and makes the only difference between animate and inanimate matter.
3. The chief and general actions of nature, are division and composition of parts, both of which are done but by one act; for at the same time, when parts separate themselves from such parts, they join to other parts; and this is why there can be no vacuum, nor no single parts in nature.
4. Every particular part of figure is infinitely divided and composed from and with other parts.
5. The infinite divisions and compositions hinder, that nature cannot run into extremes in her particulars, but keep the parts and actions of nature in an equal balance.
6. The inanimate part of matter has life, sense, and self-knowledge, as well as the animate; but being not moving in itself, or its own nature, it has not such a perceptive sense and self-knowledge, nor such an active life as the animate has.
7. The parts of inanimate matter alter according to their commixture with the animate, and so do their particular self-knowledges.

8. As parts alter by the changes of motions, so do particular perceptions.

9. Though all perceptions are figurative actions, yet no particular creature can undoubtedly affirm that all are made by patterning or imitation; by reason as the parts and actions of nature are infinite, so are also particular perceptions, and being infinite they cannot be known by any particular creature.

10. There are besides exterior perceptions, voluntary actions, both of sense and reason, not made by imitation but freely and by rote, and these may be called conceptions rather than perceptions.

11. Those are much in the wrong who believe that man can know no more than what his five senses do inform him; for the rational part, which is the purest, subtlest, most active, and inspective part of nature, does inform itself of things which the sensitive cannot; as for example, how were the new world and the antipodes found out? For they were neither seen, nor heard of, nor tasted, nor smelled, nor touched. Truly our reason does many times perceive that which our senses cannot; and some things our senses cannot perceive until reason informs them, for there are many inventions which owe their rise and beginning only to reason. It is not sense, but reason that knows or perceives; there is something beyond itself and beyond nature which is the only, eternal and omnipotent God, and there can be no higher conception than this. For what is beyond it is supernatural and belongs to supernatural creatures, as for example those divine souls which God has given to men, above their rational material souls; but as for the wicked souls, they come not from God but are irregularities of nature, which God certainly will punish, as a master does the evil actions of his servant.

12. Art is but a natural creature or effect and not a creator of anything.

13. Colour, magnitude, figure, place, time, gravity, levity, density, rarity, compositions, divisions, alterations, &c.

are all one and the same with self-moving matter, and nothing else but the various actions of nature, which actions can no more be separated from body than body can from matter or parts from their whole. For all that is natural is corporeal, and therefore the distinction into substances and accidents is to no purpose, since there cannot really be, nor imagined, such a thing as an incorporeal or substanceless motion or action in nature.

But some perhaps will say, if every part and particle of nature has magnitude, colour, figure, place, &c., how is it possible that they can be one and the same with body, since they are subject to several perceptions?

To which I answer, the several perceptions do not make them to be several bodies, but they are patterned out or perceived as several properties or attributes of one body, or as several effects of one cause; for though there is but one cause in nature, which is self-moving matter, yet that only cause must of necessity have several effects or properties, as figure, colour, place, magnitude, &c. And if I may without offence make a comparison between the creator and a creature, God is but one in his essence, as one infinite and eternal God, and yet has several divine attributes; and though the parts of nature cannot comprehend, conceive, or perceive God, yet they may conceive somewhat of his several attributes, after several manners or ways. In the like manner, although there is but one matter, yet that matter may be perceived after several manners or ways, it being impossible that matter, or any part or particle of matter, although it were single, should be without those several mentioned proprieties; for can any one conceive or imagine a body without figure, magnitude, place or colour, were it as little as an atom? And since there are no natural figures or creatures but consist of parts, those composed figures may have a different magnitude, place, colour, &c. from their parts and particles were they single; but being self-moving, those figures may alter by self-motion. For 'tis as impossible for a body to be without parts as for parts to be without body, but if matter were not self-moving, there would neither be alterations, perceptions, nor any natural actions, although there might be a fixed self-knowledge in nature's parts. And thus it is no wonder how there can be several perceptions of one figure, by

reason there's no figure but is composed of parts, and as we can conceive a whole and its parts, which yet are one and the same thing, several ways (for a whole we conceive as a composition of parts, and parts we conceive as a division of the whole), so we may figure, place,

magnitude, &c. And as we cannot conceive nor perceive motion without body; so neither can we conceive those mentioned properties without body, or body without them, they being nothing else but the corporeal, figurative actions of nature.

PERSONAL USE ONLY, DO NOT REPRODUCE 2026-04-07 ids467@cornell.edu **FOUNDATIONS OF NATURAL PHILOSOPHY⁵**

PERSONAL USE ONLY, DO NOT REPRODUCE 2026-04-07 ids467@cornell.edu *Appendix, First Part*

PERSONAL USE ONLY, DO NOT REPRODUCE 2026-04-07 ids467@cornell.edu **CHAP. IX. OF SEVERAL RELIGIONS.**

Concerning the several religions, and several opinions in religions, which are like several kinds and sorts, the question is, Whether all mankind could be persuaded to be of one religion or opinion?

The opinion of the minor part of my thoughts was that all men might be persuaded. And the opinion of the major part of my thoughts was that nature, being divisible and compoundable, and having free-will as well as self-motion, and being irregular as well as regular, as also variable, taking delight in variety, it was impossible for all mankind to be of one religion or opinion.

The opinion of the minor part of my thoughts was that the grace of God could persuade all men to one opinion.

The major part of my thoughts was of opinion that God might decree or command nature: but, to alter nature's nature could not be done unless God, by his decree, would annihilate this nature and create another nature, and such a nature as was not like this nature; for it is the nature of this material nature to be alterable, as also to be irregular as well as regular, and, being regular and irregular, was a fit and proper Subject for God's justice and mercies, punishments and rewards.

PERSONAL USE ONLY, DO NOT REPRODUCE 2026-04-07 ids467@cornell.edu **CHAP. X. OF RULES AND PRESCRIPTIONS.**

As Saint Paul said, we could not know sin but by the law; so we could not know what punishment we could

or should suffer but by the law, not only moral but divine law. But, some may ask, what is law?

I answer: law is limited prescriptions and rules.

But, some may ask, whether all creatures in nature have prescriptions and rules? I answer that, for anything man can know to the contrary, all creatures may have some natural rules, but every creature may choose whether they will follow those rules, I mean, such rules as they are capable to follow or practice: for several kinds and sorts of creatures cannot possibly follow one and the same prescription and rule. Wherefore, divine prescriptions and rules must be according to the sorts and kinds of creatures, and yet all creatures may have a notion and so an adoration of God, by reason all the parts in nature have notions of God. But, concerning particular worships, those must be prescriptions and rules, or Nature have notions of God. But, concerning particular worships, those must be prescriptions and rules, or else they are according to every particular creature's conception or choice.

PERSONAL USE ONLY, DO NOT REPRODUCE 2026-04-07 ids467@cornell.edu **CHAP. XI. SINS AND PUNISHMENTS ARE MATERIAL.**

As all sins are material, so are punishments: for material creatures cannot have immaterial sins, nor can material be capable of immaterial punishments, which may be proved out of the sacred scripture. For all the punishments that are declared to be in hell, are material tortures: nay, hell itself is described to be material, and not only hell, but heaven is described to be material. But whether angels and devils are material, that

5. Excerpted from *Grounds of Natural Philosophy* (London: Printed by A. Maxwell, 1668). [EEBO]